Illinois U Library

ting High-Speed Steel—p. 118
al Show Preview—p. 137
ction Heating Selector—p. 139
ealing Stainless Bars—p. 143
shall Plan Steel Outlook—p. 181
p Overgrading Serious—p. 184
hed Steel Shipments—p. 186

The
IRON AGE
OCTOBER 16, 1947

Everybody agrees
COSTS MUST
COME DOWN
Clinker

HIGH SPEED production is definitely a function of New Departure ball bearings.

Operating with less friction and less wear—supporting vital machine parts with extreme accuracy and little need for attention, the ball bearing is a "natural" for today's exacting production requirements.

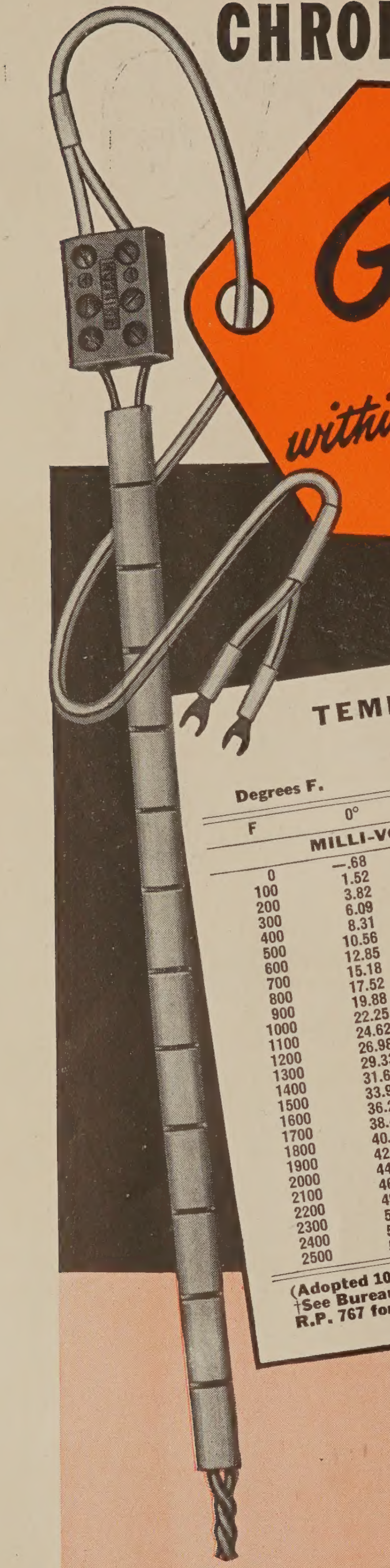
That is why in the newest and finest machines you will find more New Departure ball bearings than ever before.

An investment in machines of modern ball bearing design is an investment in greater accuracy—*faster* production—*lower* costs.

nothing rolls like a ball
NEW DEPARTURE
BALL BEARINGS

NEW DEPARTURE
DIVISION OF
GENERAL MOTORS
BRISTOL, CONN.
Branches in DETROIT,
CHICAGO, LOS ANGELES
and other cities

CHROMEL-ALUMEL* THERMOCOUPLES



Guaranteed . . . . TO PRODUCE TEMPERATURE—E.M.F. VALUES SHOWN BELOW

within ±5° FROM 32° F. TO 660° F.
±¾% FROM 660° F. TO MAXIMUM WORKING TEMPERATURE

TEMPERATURE—MILLI-VOLT EQUIVALENTS

As established by U.S. Bureau of Standards†

CHROMEL-ALUMEL

Cold-End, 32° F.

Degrees F.	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°	100°
F	MILLI-VOLTS										
0	—.68	—.47	—.26	—.04	—.18	.40	.62	.84	1.06	1.29	1.52
100	1.52	1.74	1.97	2.20	2.43	2.66	2.89	3.12	3.36	3.59	3.82
200	3.82	4.05	4.28	4.51	4.74	4.97	5.19	5.42	5.64	5.87	6.09
300	6.09	6.31	6.53	6.75	6.98	7.20	7.42	7.64	7.87	8.09	8.31
400	8.31	8.53	8.76	8.98	9.20	9.43	9.66	9.88	10.11	10.33	10.56
500	10.56	10.79	11.02	11.25	11.47	11.70	11.93	12.16	12.39	12.62	12.85
600	12.85	13.08	13.31	13.55	13.78	14.01	14.24	14.48	14.71	14.94	15.18
700	15.18	15.41	15.64	15.88	16.11	16.35	16.58	16.82	17.05	17.29	17.52
800	17.52	17.75	17.99	18.22	18.46	18.70	18.93	19.17	19.41	19.64	19.88
900	19.88	20.12	20.36	20.59	20.83	21.07	21.30	21.54	21.78	22.01	22.25
1000	22.25	22.49	22.72	22.96	23.20	23.43	23.67	23.91	24.14	24.38	24.62
1100	24.62	24.85	25.09	25.33	25.57	25.80	26.04	26.27	26.51	26.74	26.98
1200	26.98	27.21	27.45	27.68	27.92	28.15	28.39	28.62	28.86	29.09	29.33
1300	29.33	29.56	29.79	30.02	30.26	30.49	30.72	30.96	31.19	31.42	31.65
1400	31.65	31.88	32.11	32.34	32.57	32.80	33.03	33.26	33.49	33.71	33.94
1500	33.94	34.17	34.40	34.62	34.85	35.08	35.30	35.53	35.75	35.98	36.20
1600	36.20	36.42	36.65	36.87	37.10	37.32	37.54	37.76	37.99	38.21	38.43
1700	38.43	38.65	38.87	39.09	39.31	39.53	39.75	39.96	40.18	40.40	40.62
1800	40.62	40.83	41.05	41.27	41.48	41.70	41.91	42.13	42.34	42.56	42.77
1900	42.77	42.98	43.20	43.41	43.62	43.83	44.04	44.26	44.47	44.68	44.89
2000	44.89	45.10	45.31	45.52	45.73	45.93	46.14	46.35	46.56	46.76	46.97
2100	46.97	47.18	47.38	47.59	47.79	47.99	48.20	48.40	48.61	48.81	49.01
2200	49.01	49.21	49.41	49.61	49.81	50.01	50.21	50.41	50.61	50.80	51.00
2300	51.00	51.20	51.39	51.59	51.78	51.98	52.17	52.37	52.56	52.75	52.95
2400	52.95	53.14	53.33	53.52	53.71	53.90	54.09	54.28	54.47	54.66	54.85
2500	54.85	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

(Adopted 10-25-32)
†See Bureau of Standards Research Papers—
R.P. 767 for "Standard Tables for Chromel-Alumel Thermocouples."
R.P. 768 for "Method of Testing Thermocouples."
R.P. 1278 for "Stability of Base Metal Thermocouples in Air at 800° to 2200° F."

If sustained accuracy of temperature measurement is important to the finished quality of your work, make sure your pyrometers are calibrated for Hoskins' CHROMEL-ALUMEL thermocouples. Extremely durable, highly responsive to temperature fluctuations, they carry a positive guarantee of accuracy that has made them standard equipment with nearly every pyrometer being manufactured today. You'll find complete technical information in our Catalog-59. *Want a copy?*

HEATING ELEMENT WIRE
Chromel*
NICKEL CHROMIUM

HOSKINS MANUFACTURING CO.

4445 LAWTON, DETROIT 8, MICHIGAN

ELECTRIC HEAT TREATING FURNACES • HEATING ELEMENT ALLOYS • THERMOCOUPLE AND LEAD WIRE • PYROMETERS • WELDING WIRE • HEAT RESISTANT CASTINGS • ENAMELING FIXTURES • SPARK PLUG ELECTRODE WIRE • SPECIAL ALLOYS OF NICKEL • PROTECTION TUBES

*TRADE MARK REG. U.S. PAT. OFF.

THE IRON AGE, published every Thursday by the *CHILTON CO. (INC.),* Chestnut and 56th Sts., Philadelphia 39, Pa. Entered as second class matter Nov. 8, 1932, at the Post Office at Philadelphia under act of March 3, 1879. $8 yearly in North America and South America, Foreign $15. Vol. 160, No. 16.

How to get an overhung load off your mind

HERE'S how one manufacturer handles overhung bearing loads.

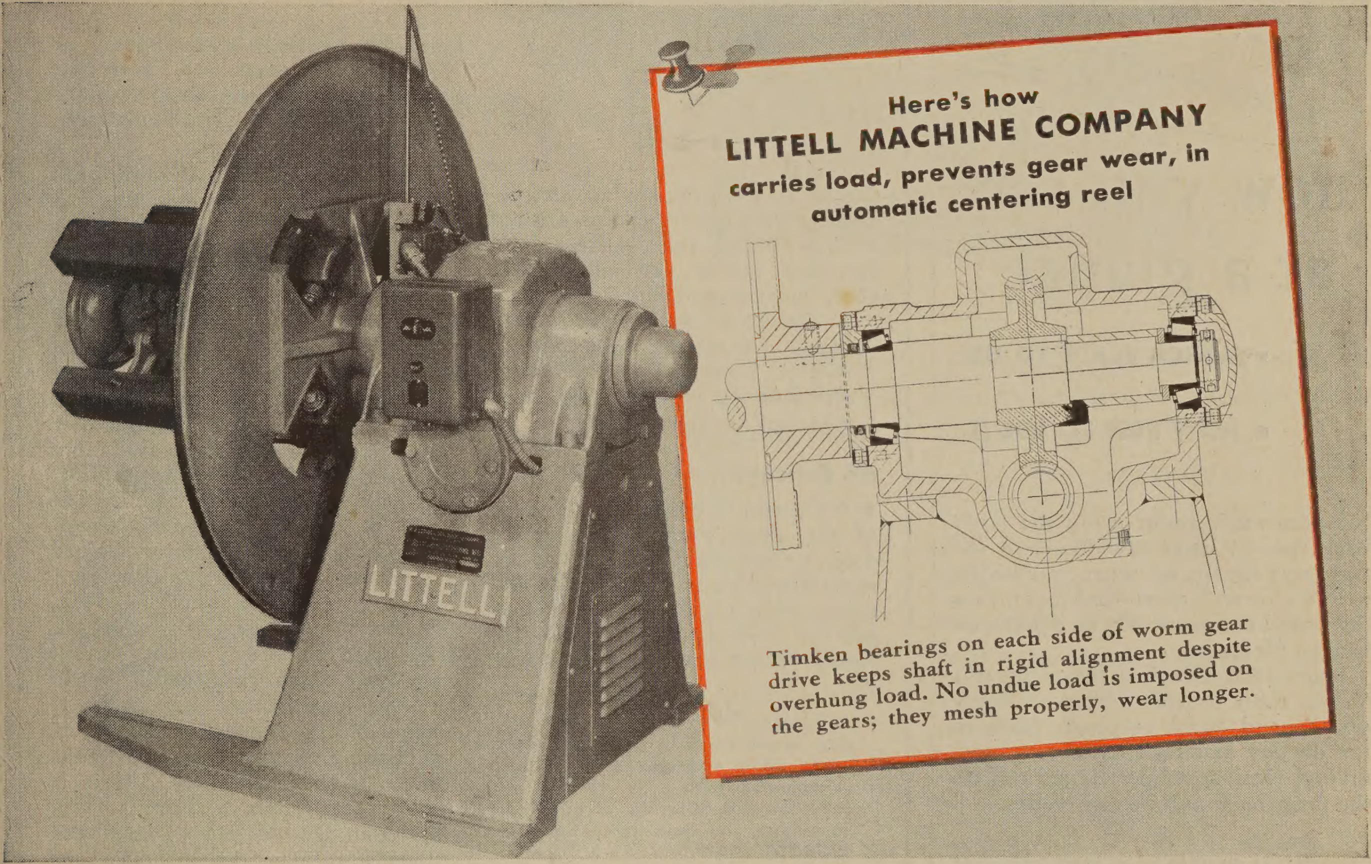
The Littell Automatic Centering Reel feeds coils of sheet steel to a stamping or punching machine. The weight of the coil—often as large as 40″ O.D.—is considerable, and the rotating shaft which carries it is entirely unsupported at the outer end. To carry the resultant overhung load, and assure smooth, frictionless operation, Timken tapered roller bearings were selected.

Timken bearings are made to carry tough loads. Unequalled load carrying capacity is provided by the *line* contact between rolls and races. And the tapered construction of Timken bearings carries both radial and thrust loads.

Timken bearings are made of heat-treated Timken fine alloy steel—manufactured to amazing standards of precision. Thus, the bearings usually last the life of the machine in which they are used.

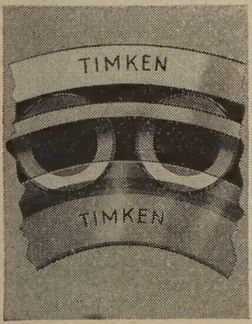
Timken bearings are first choice throughout all industry for all kinds of equipment. Be sure you have them in the equipment you buy or build. The Timken Roller Bearing Company, Canton 6, Ohio.

TIMKEN BEARING EQUIPPED *This symbol on a product means its bearings are the best.*



Here's how
LITTELL MACHINE COMPANY
carries load, prevents gear wear, in automatic centering reel

Timken bearings on each side of worm gear drive keeps shaft in rigid alignment despite overhung load. No undue load is imposed on the gears; they mesh properly, wear longer.

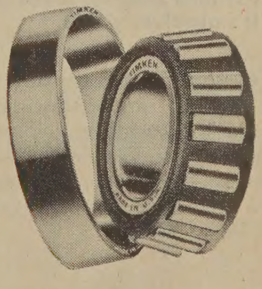


POSITIVE ROLLER ALIGNMENT

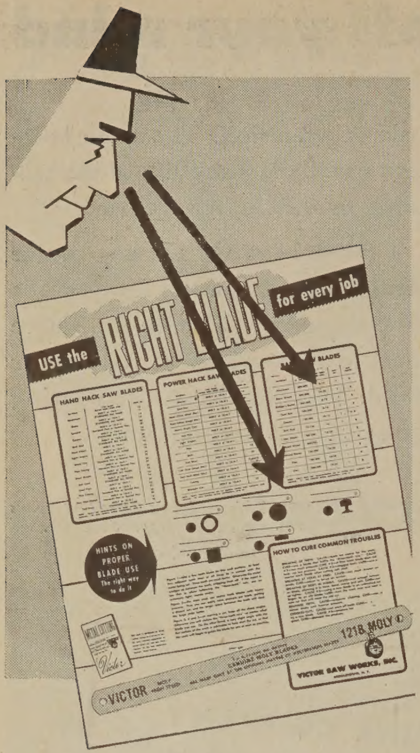
Rollers of Timken bearings are prevented from skewing by the wide area contact between roll ends and rib of the cone . . . a development of The Timken Roller Bearing Company. Result: bearings roll easier, last longer.

The Timken Roller Bearing Company is the only bearing manufacturer in the country which makes its own steel, and is the acknowledged leader in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis steels.

TIMKEN
TRADE MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS



NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION


USE the RIGHT BLADE for every job
HAND HACK SAW BLADES
POWER HACK SAW BLADES
HINTS ON PROPER BLADE USE
HOW TO CURE COMMON TROUBLES
1218 MOLY
VICTOR
VICTOR SAW WORKS, INC.

now you see at a glance

- WHICH BLADE TO USE
- HOW BEST TO USE IT

No guesswork about using the *right* hack saw or band saw blade in the *right* way for any job when you use the new Victor wall chart—and that means faster and cleaner work, no rejects, no broken blades.

Printed attractively in two colors this Victor chart tells at a glance exactly which hand, band, or power blade to use on *any* material. It gives money-saving, work-speeding suggestions on the proper use and care of blades.

Write on your letterhead today for your free Victor wall chart and hang it near the tool crib or in your machine shop for ready reference. It's absolutely free.

Turn to your Victor supplier, too, for better-cutting, longer-lasting blades. He has a Victor blade for every job a hack saw or band saw can do—one that you can rely on to give you fast, clean cuts on metals, plastics and other non-metallics.

3375

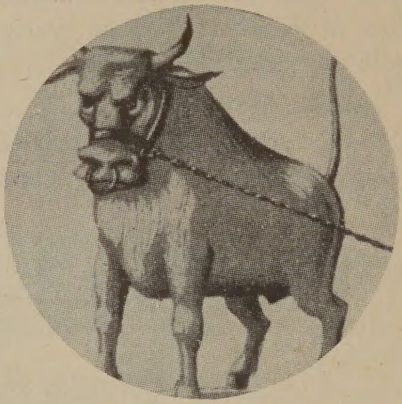
VICTOR SAW WORKS, INC.
MIDDLETOWN, N. Y., U. S. A.
Makers of Hand and Power Hack Saw Blades, Frames and Band Saw Blades.

Fatigue Cracks

BY C. T. POST

No Bull

• • Reader reaction waves on the Keystone Steel & Wire Co. advertisement in the September 11 issue have been bouncing back like a supersonic tester. The farm belt says it's 10 to 1 that some city slicker drew this illustration for the ad. The accompanying text declares, "While most chains are not stronger than the weakest link, Hercules chains are not weaker than the strongest bull."



"Oh, yeah," declare the farm boys. "Not even a picket chain made of 8-gauge Keystone wire will hold the critter unless it's attached to the nose ring."

No Bullseye

• • Charles C. Finn, Seattle agent of the John Finn Metal Works, doesn't come right out and say we should be shot, but he heartily disagrees with our September 18 suggestion that a .45 caliber pistol would be no more than a squirt gun.

> "Webster defines caliber as the inside diameter of a tube but, by usage, 30-30 means a barrel .30 in. in diameter inside . . . shooting a cartridge with 30 grains of powder. Sometimes you have three figures, 45-70-500 which is a .45 in. diameter barrel, 70 grains of black powder and a 500 grain lead bullet. It is quite proper to say either .45 caliber (which is really the more accurate), or 45 Cal in which the 45, by usage, means 45 hundredths of an inch. If you want to get up to cannon, then caliber means the length of the barrel. Thus, for example, a 16 in. rifle of 60 calibers would have a barrel 60 times the bore in length, or 80 ft."

Reader Finn, former director of the National Rifle Association, and longtime secretary of the Seattle Rifle Club, has the last word. We never argue with a man with a gun.

Circus

• • If the Congressional investigating committee ever catches on to the latest frolic of the War Assets Administration in surplus plant disposal, the Republican members will be trumpeting to the skies. The big government-owned Boeing Aircraft plant at Renton, Wash., near Seattle, is serving as winter quarters for a circus!

Weather was bad and crowds were slim in Canada and the Pacific Northwest for the Sparks mammoth show, and it decided to throw in the sponge for the winter early. It was no easy trick to find a secluded nook for ten freight cars of paraphernalia, including elephants, horses, bears, monkeys and the rest. Up stepped the War Assets Administration with the suggestion that the aircraft plant would be ideal, and the deal was made.

Already we can see the headlines screaming, "Government Runs 3 Ring Circus" and pictures of a chimpanzee screaming across the table at Senator Brewster.

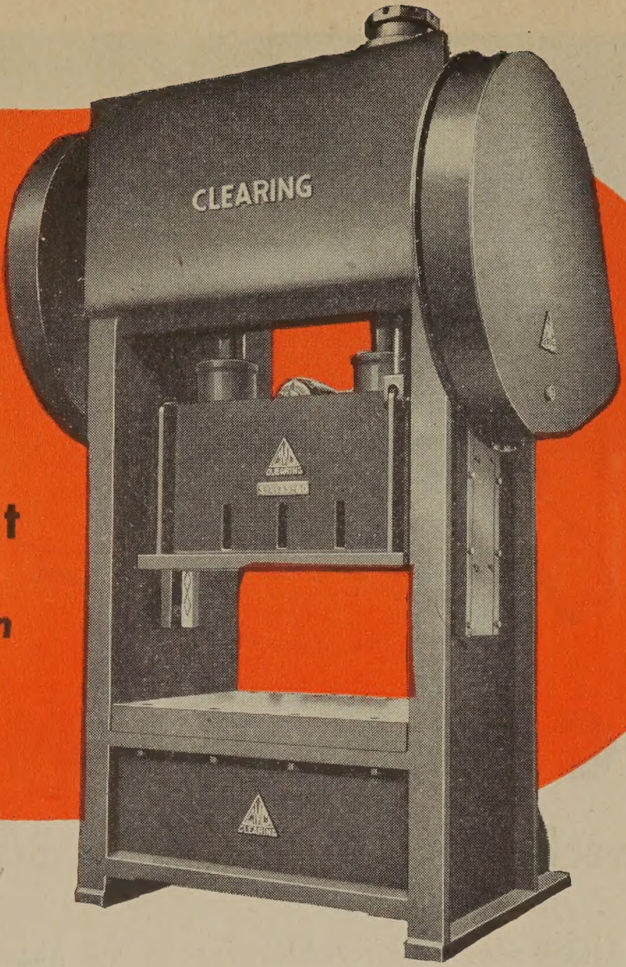
Waterloo

• • Never in our lives have we admitted that any of the editors of your f.f.j. are all wet . . . but now we are forced to confess that Tom Lloyd, the new machine tool editor, at least started that way on his new job. Out in Pittsburgh, where Tom was resident editor before migrating to the big city, he was a member of an organization known as the "Don't Put Your Feet on the Wall Sonny-boy Blues Marching and Chowder Society" made up, principally, we are told, of some of the rougher elements of publishing, advertising, and publicity in the Steel City. It is a habit of the clan to throw a "Get the Man Out of Town" clambake when a member leaves and Tom was no exception.

The gang took over a country place for the shindig and as a final parting gesture undertook to take a picture of Tom standing alongside the swimming pool. The pose was a little too Napoleonic to suit the boys so they pushed Tom in the pool clothes and all and then snapped him as he came up to blow. The photo fiends claim the result was pleasingly informal and candid . . . in fact, for the first time in his life Tommy wasn't even posing as the shutter clicked.—John Huggett.

✓ WIDTH You Want
✓ DEPTH You Want
✓ STROKE You Want
✓ TONNAGE You Want

in any practical combination and without paying for a "special" press

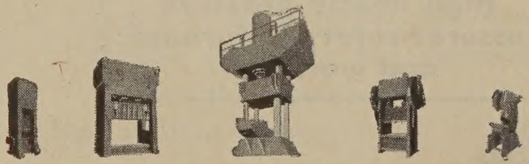


TYPE S

Capacities 60 to 250 tons

In developing this new line of presses, Clearing engineers have not only produced machines of remarkable basic worth, but have made it possible to offer unusual flexibility of specification without serious penalty in the way of cost. Thanks to the welded steel construction—a procedure which Clearing pioneered long ago—dimensional variations in small increments are easily provided. Ingenious planning of the mechanical parts permits wide interchangeability. In short, with the Type S, Clearing is able to build virtually a special press out of stock parts. This means a saving of both time and money for press buyers.

Maximum economy of production in this competitive world can be attained only when the machinery is properly fitted to the task. Here is the way to get presses which exactly match your requirements, giving you top productive efficiency without undue capital investment. We urge you to consult Clearing engineers as to the best way you can apply this opportunity to your own profit. Write for full information.

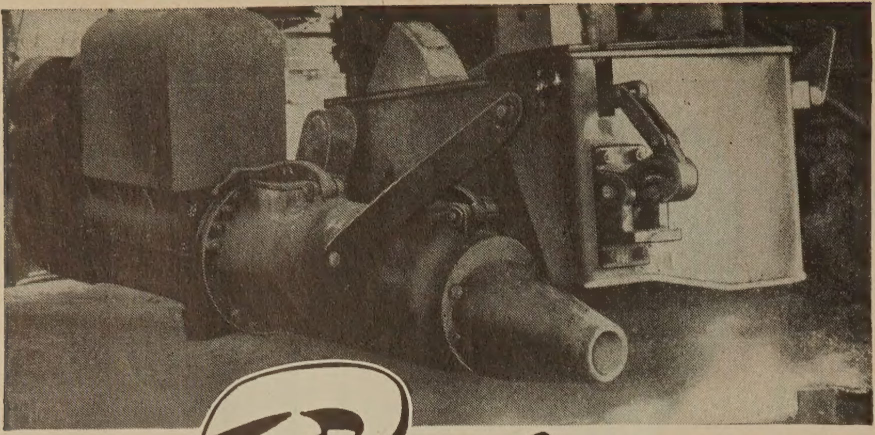


MECHANICAL AND HYDRAULIC PRESSES ★ 45 TONS CAPACITY AND LARGER

CLEARING

THE WAY TO EFFICIENT MASS PRODUCTION

CLEARING MACHINE CORPORATION
6499 WEST 65TH STREET • CHICAGO 38, ILLINOIS

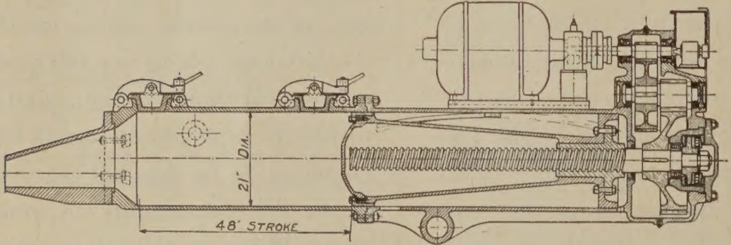


Bailey

CLAY GUN

Powerful electrically-driven Piston

The Bailey Lever Action forces the nose of the gun to accurately hit the tapping hole. In the Bailey Clay Gun, the powerful, positive motor-driven screw provides the pressure necessary on the piston to maintain long tapping holes.



High nozzle pressure assures safety to furnace and workmen

WILLIAM M. Bailey COMPANY
ENGINEERS
LEADERSHIP THROUGH QUALITY
PITTSBURGH PENNSYLVANIA

Dear Editor:

NYLON GEARS

Sir:

In the Sept. 16 edition of Newsfront you refer to nylon gears being tested in competition to bronze gears. Please advise us of the manufacturer and West Coast representative of the nylon gears.

LESLIE F. HAWES
General Manager
Southern California Metal Spinning Co.
Inglewood, Calif.

● R. W. Schreck, Hydraulic Press Mfg. Co., Mt. Gilead, Ohio, is familiar with this development.—Ed.

TACKS AND NAILS

Sir:

. . . It would be much appreciated if you would give us the name of a company producing a machine capable of turning out tacks of the carpet type and nails up to the 6-in. spike class.

R. E. LAWRENCE
Machine Tool Dept.
A. R. Williams Machinery Co., Ltd.
Toronto

● We are forwarding names of companies who can undoubtedly help you.—Ed.

METAL WINDOW SHADES

Sir:

In the Newsfront of Aug. 12, the 13th item refers to a new window shade that is cut and formed from a solid metal sheet. I would appreciate very much if you could give me any information as to who is producing this window shade at the present time.

J. HARRY WILSON
Factory Manager
Kirsch Co.
Sturgis, Mich.

● Wart Bros., 1100 N. Cicero Ave., Chicago.—Ed.

SWAGING MACHINES

Sir:

We have been advised that you could possibly give us some information on swaging machines. We are anxious to obtain literature on swaging operations such as are performed by Etna and Langelier swaging machines. If you know where such literature is available we would appreciate your advising us.

J. R. HAWITT
Purchasing Agent
Gray Forgings & Stampings Ltd.
Toronto

● Suggest your getting in touch with the firms whose names are being forwarded to you.—Ed.

PIPE AND FITTINGS

Sir:

We are anxious to know if you have a book or catalog on pipe and fittings giving sizes and prices. . . .

EUGENE D'AGOSTINO
Cadum Scrap & Salvage Co.
Brooklyn

● Prices of steel pipe as sold by the mills are published in the weekly issues of THE

Triple-Tested PRODUCTION METHOD

REQUISITION APPROVED
OFFICE OF
COMPTROLLER
★

REQUISITION APPROVED
OFFICE OF
COMPTROLLER
★

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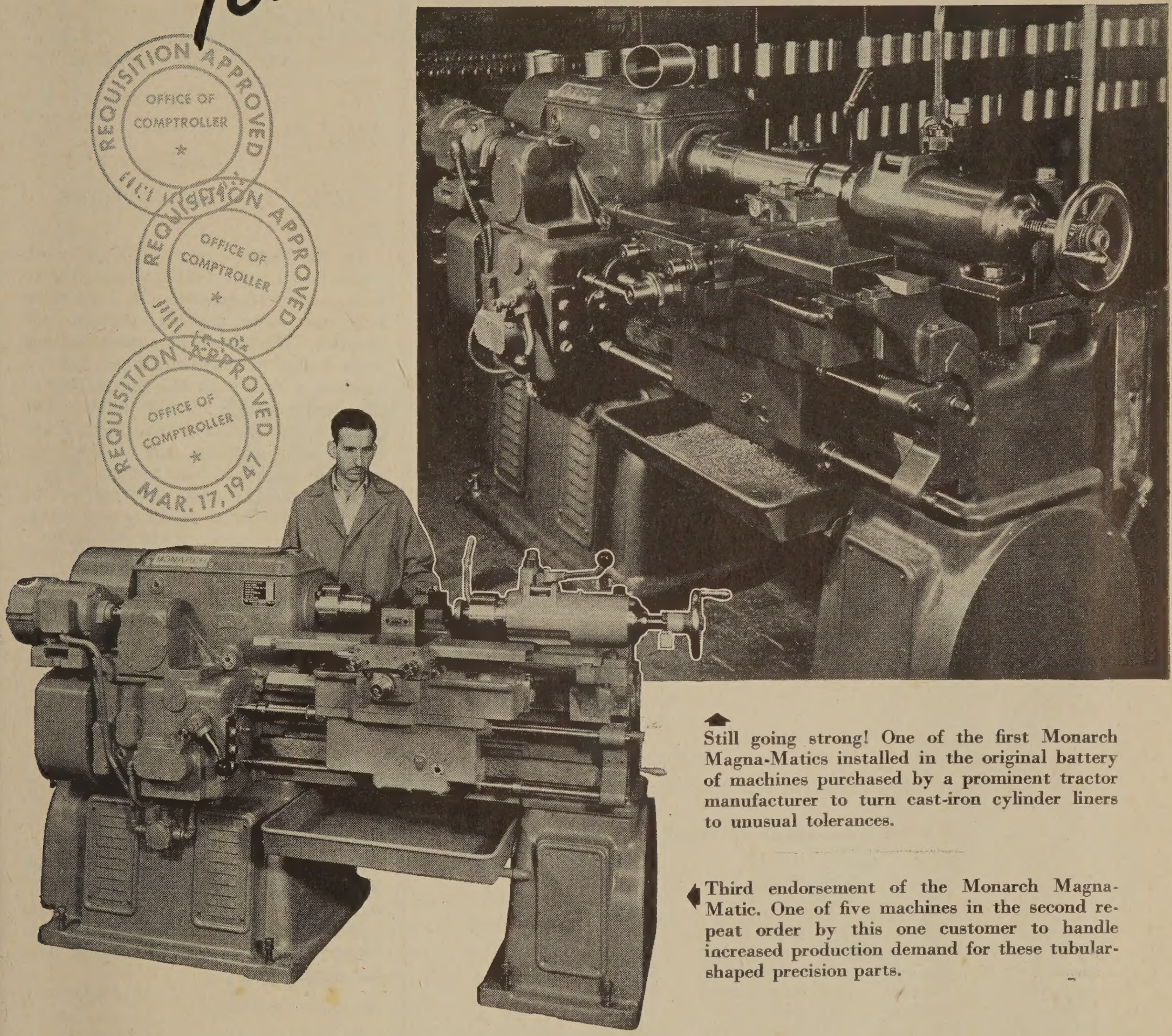
MAR. 17, 1947



Still going strong! One of the first Monarch Magna-Matics installed in the original battery of machines purchased by a prominent tractor manufacturer to turn cast-iron cylinder liners to unusual tolerances.

Third endorsement of the Monarch Magna-Matic. One of five machines in the second repeat order by this one customer to handle increased production demand for these tubular-shaped precision parts.

Cast-iron cylinder liners, 4″ diam. x 10″ long, turned to concentricity of .0002″ and a straightness of .0005″ with the center-line of the bore; diameter limit .0005″.

How well the Monarch Magna-Matic meets those tolerances is attested by the repeat orders—three batteries of machines shipped to the same customer.

This adaptation of a standard machine to the specialized production requirements of an individual user is typical of the know-how built into Monarch Metal Turning Equipment. Our engineers will be glad to translate this experience in terms of your needs—to give you *peak production at a profit.* May we hear from you?

ACCURACY · ECONOMY · LONG LIFE
Monarch
TURNING MACHINES

THE MONARCH MACHINE TOOL COMPANY · Sidney, Ohio

FOR A GOOD TURN *FASTER*—TURN TO MONARCH

IRON AGE. However, price lists of warehouses dealing in pipe in your locality might be of more help to you, as there is considerable price variation in separate sections of the country. Such lists would also be a source of information on fittings.—Ed.

PRECISION CASTING

Sir:

Kindly send us tear sheets from the Feb. 8, 1945 issue, entitled, "Refractory Molds for Precision Casting," by Jules W. Glaser.

WILLIAM ERCK
Secretary

Tyonite Corp. of America
Milwaukee

PLASTICS MELTING FURNACE

Sir:

In the Sept. 4 issue in Newsfront, there is an item that I would like to have more information on. I refer to this new type melting furnace for plastics. We have been experimenting with a dip process and have run up against a wall with the controlling of the temperature of the bath. The process that we have requires a maximum of 5° change and we have as yet been unable to hold to this. Would like to have the name and address of the manufacturer of this new tank.

R. H. CALKINS
President

Calman Mfg. Co.
Seattle

- Globe Imperial Corp., Rockford, Ill., markets this furnace.—Ed.

CORRECT ADDRESS

Sir:

In one of the Dear Editor columns there was a request . . . for a list of aluminum solder makers, The list you gave them included the name of L. S. Johnson Co., 2250 S. Indiana Ave., Chicago 16. Johnson Mfg. Co., 729 W. Washington St., Chicago, bought out L. S. Johnson Co., some time ago and are continuing to make aluminum solder. Will you please correct your list accordingly.

L. R. BRZENK

Chicago

IRON ORE SOURCES

Sir:

I would like to contact one or more steel companies who are worried over iron ore shortages. U. S. Steel is obviously out as they still have considerable good ore in Minnesota. Likewise, those who have concessions in Brazil would not be interested. Also, the Labrador crowd have their hands full. I am not interested in the Frobisher Exploration, as they haven't done anything with their concession.

I have no mining claims in the area in question. The area was given a brief going over some 20 years ago, but nothing much was done as 1000-sq mile concessions are not liked by the

SENECA
QUALITY
CONTROLLED
WIRE

MANY SHAPES, MANY FINISHES
. . . For Thousands of Uses!

Quality control at Seneca allows you to plan production without future worries about material variations. Iron, steel, low carbon, high carbon, tempered or untempered, aluminum and bronze wire are all produced according to the same high standard.

● Shapes
Square—Keystone—Flat-Round—Half-Round—Special Shapes—Straightened and cut.

●● Sizes
Number 40 W & M Gauge (.007) and larger.

●●● Finishes
Liquor Finish—Bright Galvanized—Coppered—Enameled All Colors—Annealed—Tinned—Oil Tempered.

●●●● Thousands of Uses
Aircraft
Armor
Armature
Bee
Belt Hooks
Bobby Pins
Bonnets
Bookbinders
Bottlecap
Box Stitching
Brooms
Brushes
Button
Cable
Car Seal
Clips
Clock Spring
Cotter Pins
Curtain Springs
Drapery Pin
Fish Hook
Fish Tape
Florist
Fuse
Glass Netting
Grape Tying
Gutter Broom
Hair Pin
Hat
Hat Pin
Heddle
Hooks and Eyes
Link Fabrics
Lock Springs
Mattresses
Needle
Picture Cord
Pins-Ropes
Pin Ticket
Piston Ring
Plow Steel
Reed
Regulator Spring
Ribbon
Safety Pin
Spark Coil Core
Special Springs
Spiral Binding
Stapling
Stitching
Umbrella
Valve Spring
Weaving
Wire Cloth

Save time and money by depending on Seneca Quality Controlled Wire to meet your specifications. Write today for quotation and delivery schedule.

SENECA
WIRE & MANUFACTURING COMPANY
FOSTORIA, OHIO ESTABLISHED 1905
REPRESENTATIVES AND WAREHOUSES IN ALL PRINCIPAL CITIES

Be Sure
YOU GET AN
Even-flow
OF MACHINED PRODUCTS!

WYCKOFF

Structure Controlled

Annealed COLD FINISHED STEELS

Uniform structure in your bar stock is an important step toward "even-flow" production of machined parts because the remaining variables which affect machining are under the control of your machinists.

Wyckoff Structure Controlled Annealing uniformly produces the required structure for maximum machining efficiency. Whether that structure is spheroidized or pearlitic, it will be reproduced in every lot with the high fidelity necessary to eliminate structure as a variable.

If the cost of machining medium or high carbon steel is causing you concern try Wyckoff Structure Controlled Annealed Cold Finished Steel.

COLD FINISHED STEEL
Controlled
CARBON
and
ALLOY

***Wyckoff* STEEL COMPANY**

FIRST NATIONAL BANK BUILDING • PITTSBURGH 30, PA.
3200 SOUTH KEDZIE AVENUE • CHICAGO 23, ILLINOIS
Works at: AMBRIDGE, PA.; CHICAGO, ILL.; PUTNAM, CONN.; NEWARK, N.J.
Manufacturers of Carbon and Alloy Steels—Turned and Polished Shafting
—Turned and Ground Shafting—Wide Flats up to 12" x 2"

UDYLITE

Plating Equipment

lowers costs
improves products

at Pyrene . . .

Pyrene
TO OPERATE
TURN HANDLE TO LEFT
WORK LIKE A PUMP

Udylite Plating Barrels and Udylite Automatic Plating Machines are reducing costs and improving the product at the Metal Finishing Division of Pyrene Manufacturing Company.

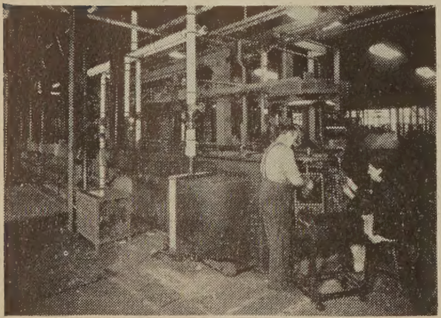
Makers of the famous Pyrene Fire Extinguishers and Pyrene Tire Chains plate a variety of their own small parts in Udylite Plating Barrels. In addition they do a large volume of diversified plating work for other concerns.

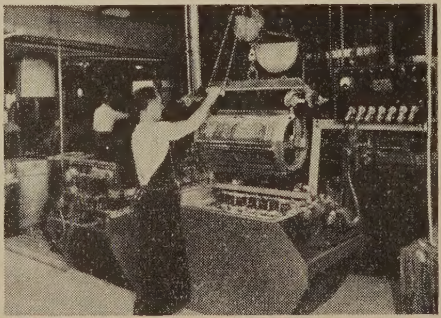
Udylite Plating Barrels are fast and economical in plating parts too small for efficient racking. Springs are cadmium plated—ball checks are tin plated at Pyrene.

The Udylite Automatic Plating Machine does a complete job on the Pyrene Tire Chains. After being loaded in racks, the chains go through various cleaning, rinsing and plating solutions automatically—are not touched or handled until cycle is completed and they are unloaded, fully plated. Udylite Automatics are fast, economical and very compact—require less floor space than any other comparable equipment.

There is a Udylite setup which will do your plating more economically. Ask the Udylite Engineer for details.

2839





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government involved. Fifty to 100 sq miles could be staked with little expense "in winter" and grab samples obtained. Hence, one could jump the area ahead of those conservatives who demand a looksee first. Old reports show values up to 68 pct iron, though hurriedly obtained 50 or more years ago. The same fellow made the reports on another area now boasting of good ores. No titanium was found in ores.

Sorry I'm not a geologist; just a prospector who has spent some time in hard rock mining and prospecting for ores on which I have worked as a miner. I have never worked in an oil field or refinery, nor an iron mine or steel mill.

A. F. ROBERTSON
146 Warren Ave.
Boston

GAS-FIRED LADLE

Sir:

The Newsfront of the Sept. 4 issue contains the information: "Latest wrinkle in aluminum permanent mold casting is a gas-fired holding ladle that keeps the metal at the proper pouring temperature and automatically tilts and fills the mold which is clamped to an opening in the ladle. Shrinkage or pipe is restricted to the sprue or molten bath and the molds vent themselves in filling to preclude entrapped gases. The entire pouring cycle is under automatic control, variable to meet a wide range of conditions." We would be grateful to obtain more information about this development.

MANUEL TAMA
Vice President
Ajax Engineering Corp.
Trenton, N. J.

● The ladle is manufactured by the Lindberg Engineering Co. and is sold by the United Foundry Craftsman Corp., 5944 S. Harlem, Summit, Ill.—Ed.

NONFERROUS SPECIFICATIONS

Sir:

We have found a definite need for several copies of the Non-Ferrous Alloy Specifications booklet which you revised in July 1944, and would appreciate it if you would advise us how these could be obtained.

J. C. WALLACE
Chase Brass & Copper Co., Inc.
Pittsburgh

● The booklet is available to readers at 25¢ each; 16¢ each for five or more copies. —Ed.

TAFT-HARTLEY ACT

Sir:

In your Sept. 11 issue, the article entitled "The Taft-Hartley Act" by Senator Taft is one of the most excellent on this subject that we have seen. Have you prepared reprints of this article for distribution to your subscribers? If so, we would appreciate 25 copies for distribution among our

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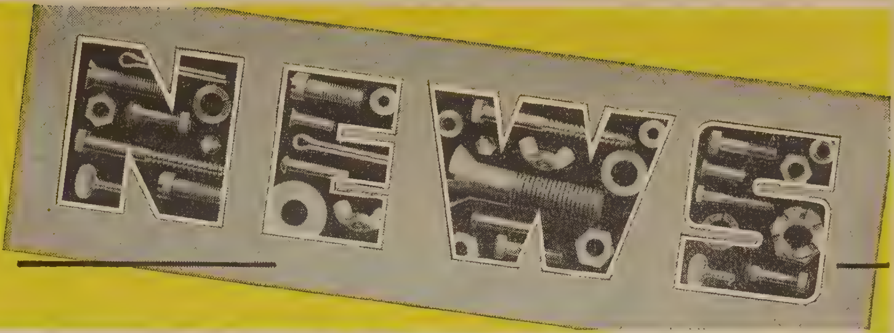

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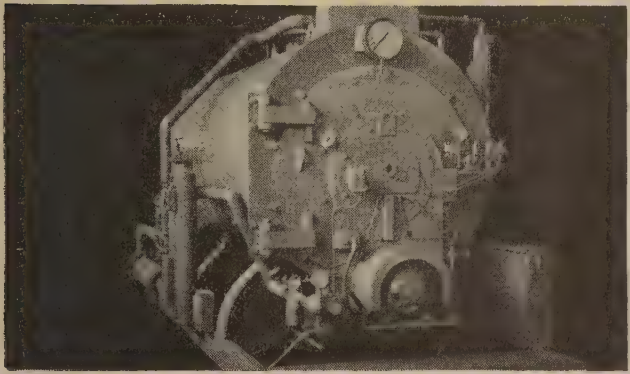

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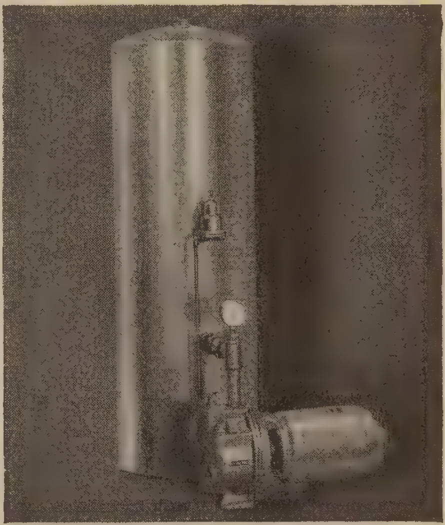

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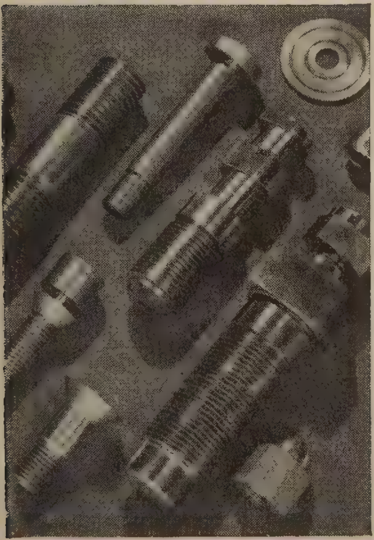

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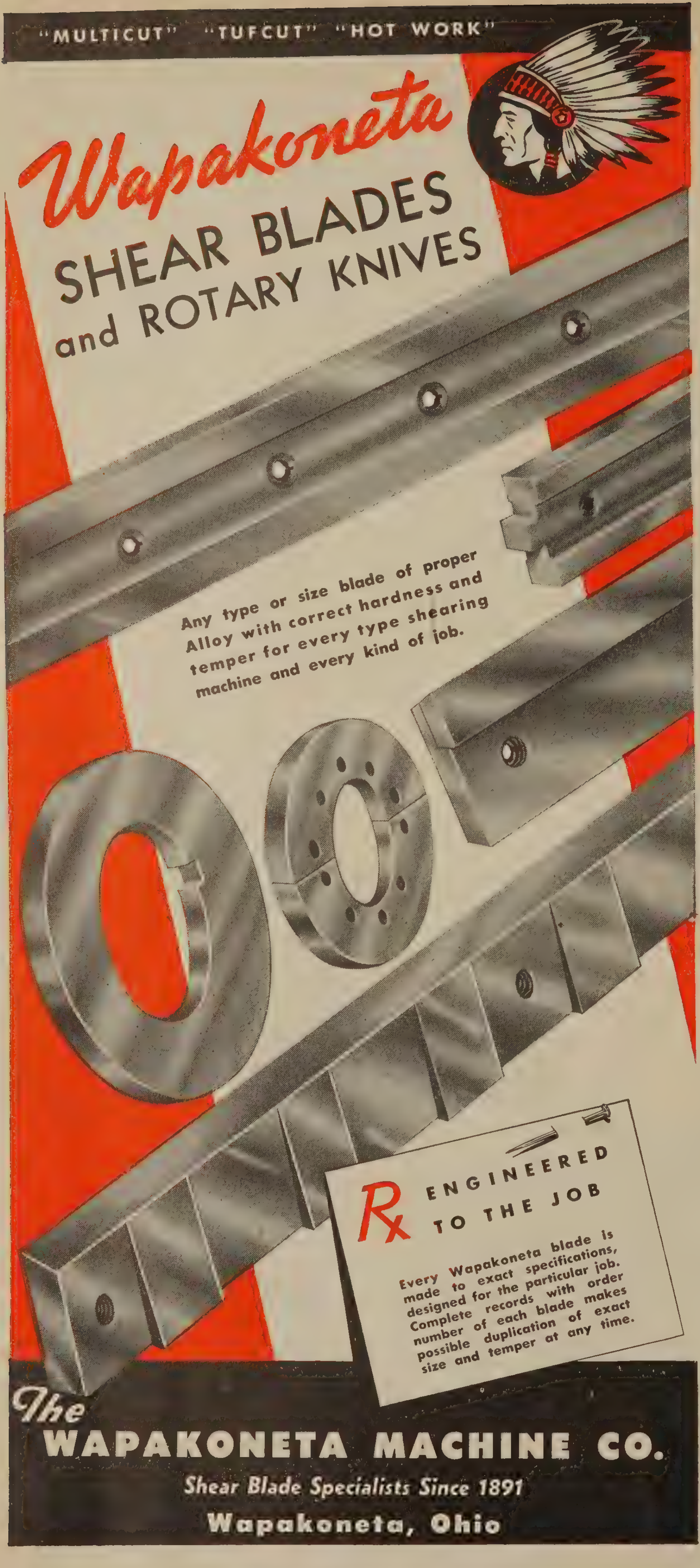

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GEO. H. HODAPP
Manager
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Huntington, W. Va.

Sir:

Do you have reprints of Senator Taft's article on p. 170 of the Sept. 11 issue. We would like to give this explanation of the law to some of our people and could use from 5 to 50 reprints if available.

EBEN RODGERS
General Mfg. Dept.
Owens-Illinois Glass Co.
San Francisco

MINIATURE MOTORS

Sir:

Please send me two reprint copies of the article, "Miniature Electric Motors Feature New Principle," which appeared in the July 10 issue.

J. WALTER BONANNO
Instrumentation Laboratory
Massachusetts Institute of Technology
Cambridge, Mass.

THREADLESS JOINT

Sir:

On p. 112 of the Aug. 14 issue there appears an illustration relating to a threadless joint which has been developed by an Australian inventor. If you can tell us where additional information regarding this joint can be obtained we would appreciate it very much.

D. L. MILLIS
Revere Copper & Brass Inc.
Rome, N. Y.

- Write to the Mechanical Engineering Dept., University of Sydney, N. S. W., Australia, where the photograph shows the joint being tested.—Ed.

CARBIDE MILLING CUTTERS

Sir:

The series of articles, "How to Use Carbide Cutters for Milling," written by H. A. Frommelt, is of much interest to me and some of my associates. Please advise if the complete article is in pamphlet form, from whom and in what manner it may be secured.

W. A. ANTRIM
Time Study Supervisor
Austin-Western Co.
Aurora, Ill.

- The series has been reprinted in booklet form and is available to subscribers at $1.00 per copy.—Ed.

STEELMAKING OXYGEN

Sir:

We are quite interested in the article which appeared on p. 113 of the Aug. 7 issue, entitled "Steelmaking Oxygen Presenting Problems to Delay Applications." We would very much like to receive 25 copies if they are available.

G. KENNETH THORNTON
Manager, Advertising Dept.
Scovill Mfg. Co.
Waterbury, Conn.

The
IRON AGE

Vol. 160, No. 16 October 16, 1947

Editorial

Queueing for Steel 115

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Technical Articles

Melting High-Speed Steel in Basic Electric Arc Furnace . . . 118
National Metal Show Preview 137
Selector Chart for Induction Heating and Melting Equipment 139
Study of a High-Speed Steel Ingot 140
High-Speed Annealing of Stainless Bars and Tubes 143
Flash Welding Theory and Practice 150
New Equipment 155

○ ○ ○

Features

Fatigue Cracks 102
Dear Editor 104
Newsfront 117
Assembly Line 160
Washington 164
West Coast 168
Personals and Obituaries 172
European Letter 176
Industrial News Summary 178
News of Industry 181
Gallup Polls 185

○ ○ ○

News and Markets

Industrial Briefs 188
50 Years Ago 189
New Construction 190
Accuses Reuther of Abuse of Prerogatives 192
United Engineering Sponsors Reserve Unit 194
Realty Brokers to Dispose of War Plants 196
Progress in Gas Turbine Materials 198
German Industry Level to Raise Steel Output 202
Long Term Shortage of Technical Manpower 208
Ford Says Steel Industry Can't Meet Demands 212
ASTE to Study Abrasives, Material Handling 216
Government Research in 1947 Cost $625 Million 219
Government Frees 2 Million Tons of Scrap in Year 221
British Exports Drop in August 222
Machine Tool Developments 224
Nonferrous Market News and Prices 226-7
Iron and Steel Scrap News and Prices 229-30
Comparison of Prices by Week and Year 231
Finished and Semifinished Steel Prices 232
Alloy Steel Prices 233
Warehouse Steel and Pig Iron Prices 235
Ferroalloy Prices 236
Replacement of Depreciating Assets Serious Problem 237
British on Wartime Gas Rationing 241
Foresee Steel Shortage for 2 Years 242
Engineers Discuss Their Part in UNESCO 244
Canadian Pacific Places Orders for $16 Million 246

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Index to Advertisers 317-18

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October 16, 1947

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Queueing for Steel

WITH panic in his heart, M. Bidault just recently flew into Washington to plead the cause of France for bare minimum tonnages of food and fuel to forestall total economic and political disruption. Count Sforza, of Italy, has spoken ominously of "Too Little and Too Late." And, Sir Oliver Franks, of England, is making the Washington rounds grimly repeating that the Paris Committee has brought (as asked by Mr. Marshall) European requirements to within the discipline of a timetable, but that the timetable permits not the slightest margin for delay or error.

These gentlemen are finding Washington officials deeply concerned with the onrushing crisis. But, so far, these same officials have singularly failed to impart a sense of urgency to the rest of the country. All the storms and fears and tensions that envelop the Marshall Plan seem to circle and re-circle within official Washington channels without, however, the formulation as yet of any thought-out or concerted policy. For the remainder of the country, the underlying danger in a "cold war" is neither vivid nor immediate.

Europe will this winter face a crisis of incalculable gravity. The very quantity and urgency of food and fuel tend to obscure the requests for equipment and raw materials listed in the Paris Plan. It is to be assumed that if the food and fuel are not forthcoming, then the demands on industry may lose all meaning. But, granting that Western Europe gets through the winter relatively intact, then the fulfillment of industrial commitments, such as steel and steelmaking equipment, may very likely involve some thorny problems of allocation.

Western Europe has set for itself some very high targets for steel production. These targets are to be reached by modernization rather than hasty creation of new capacity, and emphasis is primarily on pig iron and ingot capacity, rather than on finishing facilities. At least as regards steelmaking equipment, the Paris Report is not a shopping list. The participating countries have committed themselves to provide an impressively high proportion of this new basic equipment from their own resources, apart from specialty units such as continuous mills, the know-how for which is exclusively that of the United States. Also, to further the common effort, the participating countries have agreed to a continuing interchange of technical information.

Western Europe is asking for a total $400 million of steel plant equipment from the United States for the four-year 1948-51 period, at the rate of $100 million per year. This comparatively modest (as against food) sum, unfortunately, involves mills and finishing equipment still in short supply in this country.

The requests for steel and steel products may yet undergo further modification. Nonetheless, they will be somewhat difficult for industry to digest. At present writing (Oct. 9), the total for the four-year 1948-51 period amounts to $1.2 billion. For 1948, alone, the figure is $400 million, and involves 250,000 tons of tinplate and sheet steel; in 1949 it is 585,000 tons; in 1950, it is 460,000 tons of tinplate and sheet. These direct withdrawals must be matched by an equal amount of steel to be earmarked for fabrication into agricultural machines, refining equipment, etc., detailed elsewhere in the Paris Report.

The pressure of events is so painfully apparent that industry certainly will devise some sensible scheme to fulfill its part of the Marshall Plan. Although not as immediately urgent, steel and equipment are just as inseparable from the success of the Marshall Plan as are the food and fuel. The immediate food will maintain Western Europe at a level of extreme austerity and save the people from the worst pangs of hunger. But steel and equipment offer promise of self-reliance and self-respect by 1951, a viable economy, and blessed release from the humiliations that are inevitably the lot of the pensioner.

T. W. Lippert

Eleven years ago, Horace Blackwell came to Inland from an Indiana farm. Seven years later he had moved up from laborer, through pit man, mold inspector, and expediter, to pit foreman of No. 1 Open Hearth—in charge of a crew of thirty.

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NEWSFRONT

October 14, 1947

► Exploiting the effects of electromagnetic forces, Ajax Engineering Corp., Trenton, has developed a nonmechanical device for pumping molten metals of high melting point. Rate of flow is controlled by suitable variations of induced current in Ajax furnaces. Volume of metal pumped is dependent on duration and rate of discharge, with metal temperature remaining constant.

► A device for removing mill scale from flat rolled steel products, thus eliminating pickling and the problem of pickle liquor disposal, is in the experimental stage and a pilot plant will go on test in a midwestern mill in the near future.

► The aircraft industry is testing a new adhesive, polystal, used in German tooling and fabrication processes. Polystal is being applied cold and becomes an elastic-plastic mass after hardening. U. S. research workers report that it is stronger than surrounding wood in joints.

► Wire rope is being used on the West Coast as the heating element in an electric radiant heating system in which high amperage and low voltage current is passed through the wire ropes buried in concrete floors.

► The British Board of Trade is alarmed over the effect of Britain's high price levels on its export trade. A recent meeting among high officials was devoted almost entirely to a discussion of refusals by American buyers to order goods readily available due to price considerations.

► A small half-track tractor to sell for under $500 is being made largely of stampings. Castings are used only for transmission housings and one part of the clutch. The new tractor is powered by 6 hp air cooled engine.

► In 1947 the railroads in this country have hauled more freight than they did in a comparable period during the war. Carloadings have increased while the available car supply has constantly been diminishing. Fourth quarter loadings are expected to be up 6.2 pct over 1946.

► Special micrometers along with pin gages are being used to measure the accuracy and concentricity of gears. The micrometer is used to bridge several of the gear teeth, and the measurement made.

This technique has been the subject of serious discussion in the past, but for certain types of gear measuring it appears to be the best method yet developed.

► The managing director of the British Austin Motors Co., who has just returned to London, reports there that he sold $20 million worth of cars in the U. S. and Canada.

► It is a better than even bet that all General Motors passenger cars will have V-type engines by 1950. Some sources predict that a V-6 will be included in the lines. The V-type is said to have a number of design advantages because of a shorter hood. The shorter crankshaft of the V-engine is also said to be freer from vibration and knock.

► Ore companies are notifying customers not to count on full shipment of planned tonnages this year. Some consumers are concerned, but on reflection most recall that serious shortages were predicted each year during the war and almost every week during 1943, yet the dire predictions never materialized.

► Biggest obstacle now standing in the way of high compression engines is the lack of high octane fuels. Due to transportation difficulties the Detroit area has no automobile fuel higher than 80 octane on the ASTM standard although both the Atlantic and Pacific seaboard have 91 octane fuel. Some auto men feel that it may be 5 years before 91 octane fuel is available on a nationwide basis.

► Steel mill engineers have just licked a tough problem--tapping openhearth heats containing a high percentage of concrete. The solution is to check No. 2 scrap bundles more carefully for concrete content though some mills have actually stopped buying No. 2 bundles.

Melting High-Speed Steel in the Basic Electric Arc Furnace

Demanding close personal attention and exacting control in its production, 18-4-1 high-speed steel stands as a challenge to the melter and his crew. A comprehensive description of the production of an 18-4-1 heat, including a step-by-step melting procedure, is outlined herein, correlated with metal analysis, slag analysis, and power requirements. Metal and slag analyses, at seven stages of the heat, are given, and the relation of these two factors with the color of the respective slag samples is discussed.

° ° °

By H. C. BIGGE

Superintendent, Tool Steel Dept.,
Bethlehem Steel Co.,
Bethlehem, Pa.

° ° °

Two distinct periods characterize the operation of the basic electric arc furnace. The first is an oxidizing period which includes the melt-down of the charge under an oxidizing slag. This lowers the carbon content to the desired point and eliminates excess phosphorus and part of the sulfur. Skimming of this slag is followed by a second, or reducing period, in which a deoxidizing slag (known as white or "falling" slag) is employed. The chief function of this slag is to deoxidize the metal, to bring down the sulfur content, to protect the metal from oxidation, and to prevent a pickup of carbon (from the electrodes).

Only selected and properly graded scrap is used, and with the special slag treatment and careful deoxidation described above, the chemical specifications, hardenability, and other requirements can be readily met.

In the manufacture of 18-4-1 high-speed steel, a single slag is used at Bethlehem. First high-speed steel scrap and selected iron-base material are charged, both of known analysis. After calculating the approximate final composition, the major part of the ferroalloys is added, to obtain the advantage of the higher temperature in the melt-down and a more uniform distribution of the tungsten, which, due to its high specific gravity, has some tendency to segregate. Calcium tungstate, when used, is added with the scrap and serves to eliminate part of the carbon and silicon in the charge.

The record of a single-slag 18-4-1 high-speed heat, illustrating the conditions encountered during a heat of this type, is listed in fig. 1. Furnace characteristics are as follows: 7-ton basic electric arc furnace; 3-phase, 25 cycle, 4000 kva transformer; 12-in. diam graphite electrodes; magnesite bottom, hearth and side walls; closed pouring spout; removable roof, 9-in. high-alumina brick.

The charge was placed in a hot furnace and melted down without addition of reducing agents such as pulverized silicon, pulverized carbon, or calcium carbide. The oxygen in the calcium tungstate (75.61 pct WO_3 and 21.30 pct CaO) and in the rust and scale on the surface of the scrap, plays an important part in oxidizing the various elements, as clearly indicated by the slag and metal tests given in the attached tables and graphs.

It is also interesting to note the rapid reduction of the alloys in the slag during the slag treatment, as burnt lime, calcium carbide and pulverized carbon are added. This condition is illustrated by photographs of slag samples representing the various conditions from oxidizing slag to the reducing slag of the white, "falling" type.

(*Continued on page* 121)

To the electric furnace operator, the color and appearance of the slag indicate the condition of both slag and metal at the various stages of heat. Although petrographic examinations might serve well for this purpose, such an examination cannot very well be carried out at the furnace, and the melter must therefore be guided by a visual inspection of the slag or a chemical analysis. The accompanying seven colored photographs illustrate how the operator is able to follow the progress of his heat by this method.

Table I lists the material charged, while table II gives the difference in the analysis of the melt-down slag and the final ladle slag. An interesting comparison is given in table III, which shows a rather remarkable agreement between the estimated and the actual analyses of the metal.

The practice followed in obtaining the results indicated in the furnace log sheet, table IV, was as follows: Molds heated to 300°F; molds smoked with rosin for 45 sec; hot tops heated to 1200°F; temperature of ladle 1200°F; tapping temperature of metal 2900°F (immersion thermocouple); metal held in ladle 16 min. The furnace spout has a diameter of 3½ in., and the ladle nozzle 1 in. Copper stools were used in all of the molds.

A graphical study of the log sheet is presented in fig. 1 correlating metal and slag analysis with furnace additions. The detailed slag study, fig. 2, serves to supplement the seven colored photographs, and indicates a complete slag analysis for each test sample.

In order to obtain best efficiency in the reactions between metal and slag (and metal and furnace additions) the heat is rabbled repeatedly. As indicated in table IV, a total of eight manual rabbling operations are performed in the course of a typical heat, starting before the charge is melted, and performed at intervals until just prior to tapping.

An interesting correlation in the analyses of slag and metal samples taken at various stages of the heat (the slag samples are illustrated by the seven color photographs) is indicated in tables V and VI.

The total time required for the heat, from tap to tap, was 6 hr 55 min. of which 2 hr 15 min involved charging to melting, 1 hr 45 min melting time and 2 hr 45 min operating under a deoxidizing bath.

A total of 5900 kw-hr was consumed, resulting in 766 kw-hr per net ton of ingots. Upon completion of pouring each ingot, the hot top was covered with an insulating material.

As may be seen from the attached furnace log sheets, tables IV and VII, the total gross weight of the charge was 16,940 lb and the metal weight 15,874 lb. The metal recovered was 15,410 (a loss of 464 lb), representing a metal recovery of 97.07 pct. Analyses of the materials used in the charge are indicated in table VIII.

The recovery of alloys is high, except that of chromium, for which the figure is only 92.77 pct. The chromium content of the slag is correspondingly high, which may be due to a loss of chromium during the melt-down, by oxidation at the high temperature of the arc.

TABLE I

High Speed Steel Heat

Material Charged	Gross Weight, Lb	Metallic Weight, Lb
Burnt lime	200	......
18-4-1 scrap	7,137	7,137
Calcium tungstate ($CaWO_4$)	800	480
Ferrotungsten	1,346	1,346
High-carbon ferrochrome	500	500
Low-carbon base metal	5,932	5,932
Total Charge	15,915	15,395

TABLE II

Slag Analysis

Slag Analysis, Pct	Melt Down [1]	Ladle [2]
MnO	1.61	0.10
P_2O_5	0.03	0.05
FeO	3.68	0.14
Fe_2O_3	5.90	0.09
Cr_2O_3	17.41	0.06
WO_3	8.87	None
V_2O_5	6.68	0.18
CaO	23.52	55.77
SiO_2	10.20	26.80
CaF_2	11.54	5.12
CaS	0.11	0.72
CaC_2	0.16	0.75
Al_2O_3	3.83	3.98
MgO	5.82	7.17
CaO-SiO_2 ratio	2.30	2.08

[1] Slag—black, solid.
[2] Slag—white, powder.

TABLE III

Metal Analysis

	Analysis of Charge, (Aim), Pct	Estimated Analysis of Charge, Pct	Analysis Melt Down, Pct	Analysis Final Ladle, Pct
C	0.795	0.55	0.46	0.73
Mn	0.30	0.15	0.08	0.30
P	0.020	0.020	0.021	0.018
S	0.032	0.031	0.026	0.010
Si	0.46	0.27	0.17	0.18
Cr	4.29	4.08	3.26	4.10
W	18.59	18.58	17.96	18.68
V	1.15	0.48	0.37	1.17

TABLE IV

Furnace Log, 18-4-1 High-Speed Steel

Time	Operation	Furnace Charge			
		Gross Weight, Lb	Net Weight, Lb	Arc Voltage	Amperes
6:20 AM	Pouring previous heat	......	......	......	......
6:30	Began charging	......	......	......	......
	Burnt lime	200	......	......	......
	18-4-1 scrap	7,137	7,137	......	......
	Calcium tungstate	800	480	......	......
	Ferrotungsten	1,346	1,346	......	......
	High-carbon ferrochrome	500	500	......	......
	Low-carbon base metal	5,932	5,932	......	......
6:49	Finished charging—total	15,915	15,395	......	......
6:50	Power on	......	......	157	6,500
7:00	Changed power	......	......	244	10,000
7:45	Changed power	......	......	157	6,500
7:50	Changed power	......	......	83	5,000
8:15	Fluorspar	25	......	......	......
8:34	Rabbled bath	......	......	......	......
8:35	Melted	......	......	......	......
8:35	Slag and metal test No. 1	......	......	......	......
8:36	Calcium carbide	50	......	......	......
	Burnt lime	100	......	......	......
	Pulverized graphite	5	......	......	......
	Pulverized 78 pct ferrosilicon	30	......	......	......
	Fluorspar	25	......	......	......
8:52	Rabbled bath	......	......	......	......
8:53	Slag and metal test No. 2	......	......	......	......
8:54	Burnt lime	100	......	......	......
	Pulverized graphite	5	......	......	......
	Pulverized 78 pct ferrosilicon	30	......	......	......
9:11	Rabbled bath	......	......	......	......
9:12	Slag and metal test No. 3	......	......	......	......
9:13	Pulverized graphite	5	......	......	......
	Pulverized 78 pct ferrosilicon	30	......	......	......
9:34	Rabbled bath	......	......	......	......
	End reducing-slag period	......	......	......	......
9:35	Slag and metal test No. 4	......	......	......	......
9:42	Rabbled bath	......	......	......	......
9:43	Burnt lime	100	......	......	......
	Pulverized graphite	5	......	......	......
	Pulverized 78 pct ferrosilicon	30	......	......	......
10:08	Rabbled bath	......	......	......	......
10:10	Slag and metal test No. 5	......	......	......	......
	Carbon check	......	......	......	......
10:50	Carburite	50	29	......	......
11:34	Rabbled bath	......	......	......	......
11:35	Carbon check	......	......	......	......
12:46	Carburite	10	5	......	......
12:50	High carbon ferromanganese	30	30	......	......
	High carbon ferrochrome	75	75	......	......
	Ferrotungsten	80	80	......	......
	Low carbon ferrovanadium	210	210	......	......
	Fluorspar	10	......	......	......
	Burnt lime	20	......	......	......
1:05 PM	47.69 pct ferrosilicon lump	......	35	......	......
1:09	Rabbled bath	......	......	......	......
1:14	Slag and metal test No. 6	......	......	......	......
1:15	Started tapping furnace	......	......	......	......
1:16	Calcium-silicon, pulverized	......	15	......	......
1:18	Finished tapping	......	......	......	......
1:31	Started pouring ingot	......	......	......	......
1:55	Finished pouring ingots	......	......	......	......
1:56	Slag and metal test No. 7	......	......	......	......
	Total Charge	16,940	15,874	......	......
	Total Fluxes		Weight, Lb		
	Burnt lime	......	520	......	......
	CaO in calcium tungstate	......	170	......	......
	Pulverized 78 pct ferrosilicon	......	120	......	......
	Calcium carbide	......	50	......	......
	Pulverized graphite	......	20	......	......
	Fluorspar	......	60	......	......
	Total Weight	......	940	......	......

MELTING PRACTICE- BASIC ARC FURNACE HIGH SPEED STEEL- 4.00%CR.-1.00%VA.-18.00%W.

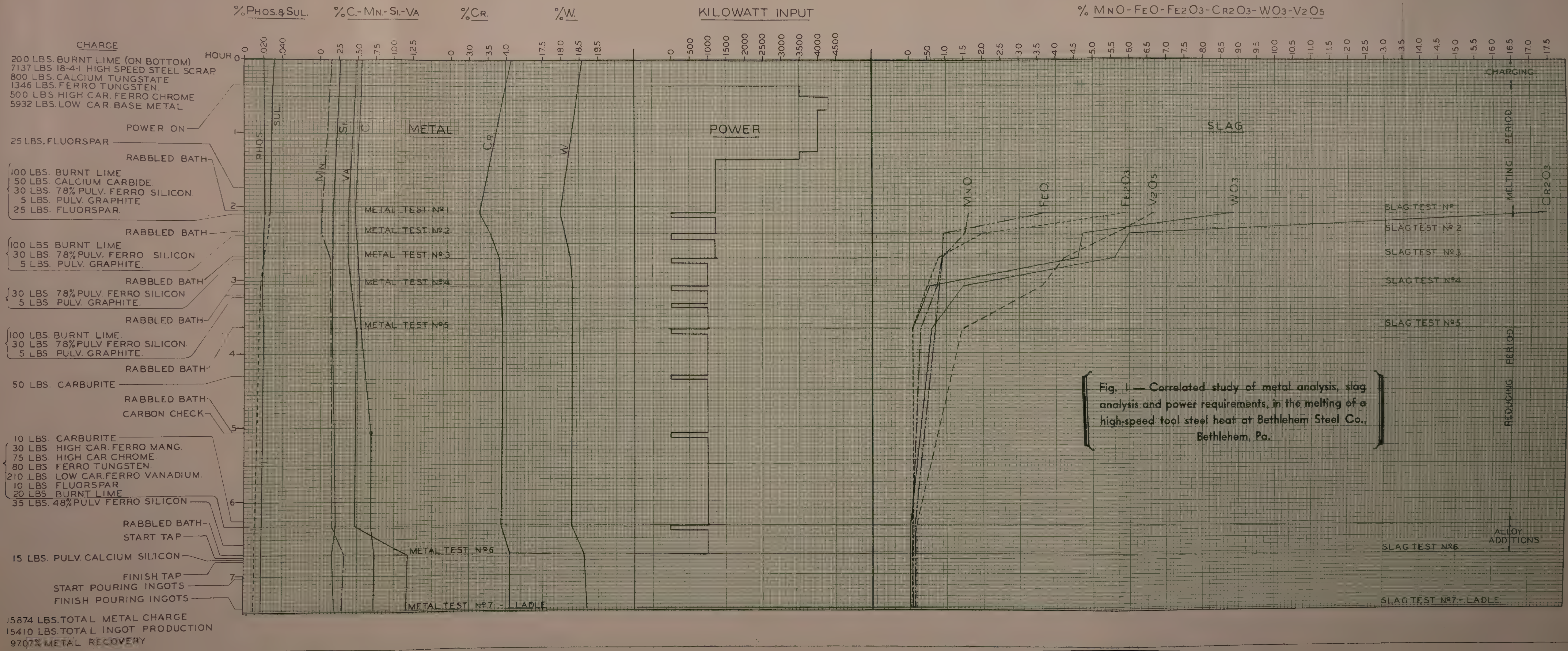


Fig. 1 — Correlated study of metal analysis, slag analysis and power requirements, in the melting of a high-speed tool steel heat at Bethlehem Steel Co., Bethlehem, Pa.

TABLE V

Metal Tests Corresponding to Slag Tests

Time	Test No.	C, Pct	Mn, Pct	P, Pct	S, Pct	Si, Pct	Cr, Pct	W, Pct	V, Pct
Charge Estimated	....	0.55	0.15	0.020	0.031	0.27	4.08	18.58	0.48
8:35 AM	1	0.46	0.08	0.021	0.026	0.17	3.26	17.96	0.37
8:53	2	0.47	0.09	0.020	0.024	0.17	3.54	18.10	0.37
9:12	3	0.50	0.12	0.020	0.020	0.17	3.78	18.24	0.37
9:35	4	0.51	0.13	0.019	0.017	0.16	3.83	18.30	0.41
9:43	5	0.53	0.14	0.020	0.015	0.16	3.89	18.30	0.48
1:10 PM	6	0.73	0.32	0.018	0.011	0.16	4.12	18.60	1.19
1:56	7	0.73	0.30	0.018	0.010	0.18	4.10	18.68	1.17

TABLE VI

Slag Analysis

	Test No.						
	1	2	3	4	5	6	7
Time	8:35	8:53	9:12	9:35	9:43	1:10	1:56
Color	Black	Black	Black	Brown	Green	White	White
Condition	Solid	Solid	Solid	Solid	Solid	Powder	Powder
Location	Furnace	Furnace	Furnace	Furnace	Furnace	Furnace	Ladle
MnO, Pct	1.61	1.42	0.90	0.77	0.31	0.08	0.10
P_2O_5, Pct	0.03	0.06	0.09	0.08	0.06	0.05	0.05
FeO, Pct	3.68	0.95	0.90	0.80	0.70	0.14	0.14
Fe_2O_3, Pct	5.90	2.05	0.80	0.48	0.11	0.11	0.09
Cr_2O_3, Pct	17.41	6.03	5.58	1.44	0.63	0.06	0.06
WO_3, Pct	8.87	4.75	4.59	0.52	0.10	None	None
V_2O_5, Pct	6.68	5.62	4.27	3.62	1.46	0.18	0.18
CaO, Pct	23.52	41.89	54.62	51.01	52.46	56.22	55.77
SiO_2, Pct	10.20	20.34	16.44	26.11	27.59	26.20	26.80
CaF_2, Pct	11.54	4.68	1.50	2.18	2.46	4.58	5.12
CaS, Pct	0.11	0.29	0.36	0.54	0.54	0.67	0.72
CaC_2, Pct	0.16	0.16	0.19	0.11	0.13	0.72	0.75
Al_2O_3, Pct	3.83	4.76	2.52	3.85	3.48	3.18	3.98
MgO, Pct	5.82	6.50	6.53	8.03	9.42	7.29	7.17
$CaO:SiO_2$ ratio	2.30	2.06	3.32	1.95	2.13	2.14	2.08

TABLE VII

Estimated Analysis of Charge

Material	Net Lb	C, Lb	Mn, Lb	P, Lb	S, Lb	Si, Lb	Cr, Lb	W, Lb	V, Lb
High-speed steel scrap	7137	51.38	14.98	0.21	0.71	20.69	282.62	1296.79	74.22
Calcium tungstate	480	0.72	0.08	0.25	2.08	....	....	479.76	....
Low-carbon base metal	5932	3.56	4.15	1.06	1.00	1.78	....	....	..
Ferrotungsten	1426	5.27	1.28	0.54	0.85	10.69	....	1175.87	...
High-carbon ferrochrome	575	28.17	3.10	0.14	0.17	10.35	398.36	....	....
High-carbon ferromanganese	30	2.08	23.43	0.02	0.011	0.46	....	....	....
Low-carbon ferrovanadium	210	0.94	0.84	0.05	0.05	3.31	....	....	108.86
Calcium silicon	15	0.10	0.01	0.01	0.01	9.20	....	....	....
Carburite	34	34.00	....	0.02	0.19	....	....	....	....
48 pct ferrosilicon	35	0.02	0.14	0.01	0.01	16.69	....	....	....
Total	15874	126.24	48.01	3.31	5.08	73.17	680.98	2952.42	183.08
Estimated analysis, Pct	....	0.795	0.302	0.020	0.032	0.459	4.29	18.59	1.15
Final analysis (ingots)	15410	0.73	0.30	0.018	0.010	0.18	4.10	18.68	1.17
Metallic weight alloys in ingots	....	112.49	46.23	2.77	1.54	27.73	631.81	2878.58	180.29
Recovery in metal, Pct	....	89.10	96.29	83.68	30.51	38.10	92.77	97.49	98.47

TABLE VIII

Analyses of Materials Used in Charge

Material	C, Pct	Mn, Pct	P, Pct	S, Pct	Si, Pct	Cr, Pct	W, Pct	V, Pct	Ca, Pct
High-speed scrap	0.72	0.21	0.017	0.010	0.29	.....	.....	.....	.....
High-carbon ferromanganese	6.96	78.10	0.070	0.030	1.55	.....	.....	.....	.....
High-carbon ferrochrome	4.90	0.54	0.025	0.030	1.80	69.28	.....	.....	.....
Ferrotungsten	0.37	0.09	0.038	0.060	0.75	.....	82.46	.....	.....
Low-carbon base metal	0.06	0.07	0.018	0.017	0.03	.....	.....	.....	.....
Low-carbon ferrovanadium	0.45	0.40	0.025	0.026	1.58	.....	.....	51.84	.....
Calcium silicon	0.65	0.10	0.050	0.053	61.35	.....	.....	.....	31.50
48 pct ferrosilicon	0.08	0.40	0.020	0.040	47.69	.....	.....	.....	.....
					SiO_2, Pct	Mo, Pct	W, Pct	Fe, Pct	CaO, Pct
Calcium tungstate	0.09	0.01	0.032	0.26	2.50	0.05	59.97	0.15	21.30
						(WO_3 = 75.61)			
						FeO, Pct	Ash, Pct		
Carburite	58.29	.....	0.044	0.322	4.88	6.14	30.32	.....	.....
	CaO, Pct	S, Pct	SiO_2, Pct	Fe_2O_3, Al_2O_3, Pct	MgO, Pct	Loss on Ignition, Pct	Residue, Pct		
Burnt Lime	95.0	0.10	1.50	0.50	1.45	0.85	0.60		
	H_2O, Pct	S, Pct	SiO_2, Pct	Pb, Pct	CaF_2, Pct				
Fluorspar	0.75	0.09	6.84	Trace	92.20				

High Viscosity Compounds Improve Stainless Plate Drawing

IN A severe drawing operation on heavy gage stainless steel for a railroad car end stamping, the Budd Co., Philadelphia, has found it expedient to use hydrogenated castor oil as the drawing compound.

The blank, 1/8 in. thick by 2½ x 4 ft, roughly heart shaped, is drawn to a depth of 4 to 5 in. with a bend radius three times thickness. Blanks cost about $25 each. Using the high viscosity hydrogenated castor oil, a batch of 180 stampings was produced without any shop difficulties except six slight fractures. Normal practice, using a bolstered lubricating compound containing a mineral filler, on this stamping required dropping the bolster after every third stamping to hone the punch and remove metal pickup deposited by cold welding. This took a half hour each time. There was also a marked tendency for fracture to occur at the drawn lobes of the heart.

The hydrogenated castor oil, heated to 150°F before application, was applied by brush to the drawing area on both sides of the blank. Since the compound is sticky and does not oxidize, it must be removed from the stamping by a hydrocarbon solvent such as gasoline or kerosene.

The hydrogenated castor oil compound is produced by the Hangsterfer Laboratories, Woodbury, N. J. Similar vegetable oil compounds of high viscosity are marketed by Quaker Chemical Products Corp., and Reilly-Whiteman-Walton Co., both located at Conshohocken, Pa. The price of such drawing compounds is appreciably higher than the conventional drawing compounds.

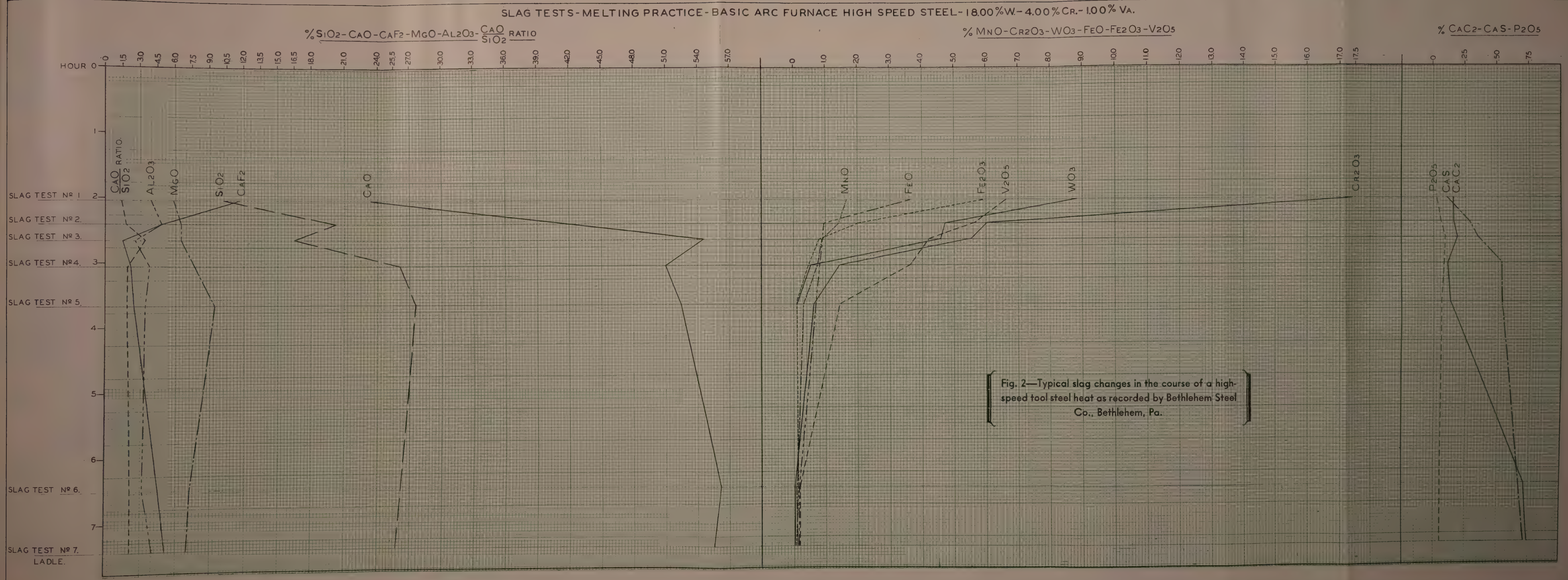


Fig. 2—Typical slag changes in the course of a high-speed tool steel heat as recorded by Bethlehem Steel Co., Bethlehem, Pa.

Chicago to Be Host To National Metal Show

● ASM President, A. L. Boegehold, General Motors Research Laboratories, Detroit.

● AIME, Institute of Metals Div. Chairman, T. S. Washburn, Inland Steel Co., Chicago.

● AIME, Iron & Steel Institute Chairman, E. A. Anderson, New Jersey Zinc Co., Palmerton, Pa.

AWS President, L. W.
ni, Hunt, Mirk & Co.,
Francisco.

● American Industrial Radium and X-Ray Society President, A. F. Cota, A. O. Smith Corp., Milwaukee.

EXPANDING its activities to include a total of seven days of exhibits and technical sessions, the 29th Annual National Metal Congress and Exposition will open in Chicago on Saturday, October 18 and continue through Friday, October 24.

The National Metal Congress, which will combine technical sessions of the American Society for Metals, the American Welding Society, the Iron and Steel and the Institute of Metals Divisions of the American Institute of Mining and Metallurgical Engineers, and the American Industrial Radium and X-Ray Society, will be conducted at the hotels at which the various societies will have their headquarters, and will be held October 20 through 24.

The exposition, which will open at 12:00 noon and close at 10:30 p.m. on October 18 and for the first five days, and open at 10:00 a.m. and close at 6:00 p.m. on October 23 and 24, will feature the metalworking equipment and products displays of approximately 375 companies and organizations. The exhibits will occupy about 240,000 sq ft of floor space at the International Amphitheatre.

The Industrial Gas breakfast, sponsored by the Industrial and Commercial Gas Section of the American Gas Assn., will be held on Wednesday morning, October 22, at the Stevens Hotel. The breakfast will be followed by the fall meeting of the Midwest Industrial Gas Council.

Some twelve of the leading technical colleges and universities will hold alumni luncheons on Wednesday, October 22, all of which will be held at the Palmer House.

The American Society for Metals has limited its technical program this year to about 30 papers. Heat treating accounts for a large portion of the subject matter of these sessions, ranging from theoretical studies of phase transformation to practical applications of induction hardening. High temperature alloys and properties of metals at both high and low temperatures, steelmaking problems, light metals and other nonferrous alloys, metalworking and testing also come in for attention.

The morning sessions of the program will be held in the Palmer House, with afternoon sessions and meetings at the International Amphitheatre. On only one day, Tuesday, October 21, will two meetings be in session simultaneously.

In addition to the regular technical sessions, a meeting on "Metallurgical Requirements of the Atomic Energy and Power Production Program" will be presented. Participants in this discussion will be leading scientists on the staff of the U. S. Atomic Energy Commission.

Two special lecture courses to be included in the program are "Introductory Physical Metallurgy" and "Copper and Copper Alloys." All lectures will be held in a meeting room of the Saddle and Sirloin Club of the International Amphitheatre.

A seminar consisting of six panel discussion meetings on the subject "Fundamental Relations in the Fracture of Metals" will be presented October 18 and 19 at the Palmer House.

In view of the great amount of interest shown in the first ASM

29th Annual National Metal Congress and Exposition

October 18 through 24, 1947

Headquarters for the four participating societies are as follows:

American Society for Metals—Palmer House
American Institute of Mining and Metallurgical Engineers—Stevens Hotel
American Welding Society—Hotel Sherman
American Industrial Radium and X-Ray Society—Hotel Morrison

Metallographic exhibit at the convention in Atlantic City last fall, a similar display has been planned for the National Metal Exposition this year in Chicago. A prominent area has been set aside at the International Amphitheatre for display of micrographs.

The annual meeting of the society will be held Wednesday, October 22, in the ballroom of the Palmer House. Following the installation of new officers for 1948 and presentation of annual reports, the Campbell Memorial Lecture will be delivered by Dr. A. B. Kinzel, vice-president, Electro Metallurgical Co.

Highlight of the annual banquet to be held Thursday evening in the ballroom of the Palmer House, will be an address by Dr. R. F. Bacher, one of the five members of the U. S. Atomic Energy Commission.

The fall meeting technical sessions of the Iron and Steel Div. and the Institute of Metals Div. of the American Institute of Mining and Metallurgical Engineers will occupy three days during the congress—October 20, 21 and 22. Headquarters of the institute will be the Stevens Hotel.

The AIME technical program has been limited this year to a total of about 22 papers, to be delivered under seven classifications, copper and copper alloys, recrystallization and grain growth, metallography, light metals, steelmaking and physical chemistry, surface films and corrosion, and a general session.

The annual fall dinner of the metals divisions, scheduled for Tuesday evening, October 21, in the Upper Tower Room of the Stevens Hotel, will feature an address by Dr. Henry T. Heald, president, Illinois Institute of Technology.

T. S. Washburn, assistant mgr., metallurgy and inspection dept., Inland Steel Co., Chicago, is chairman of the Institute of Metals Div., and E. A. Anderson, chief, metal section, research division, the New Jersey Zinc Co., Palmerton, Pa., is chairman of the Iron and Steel Institute.

Schedule for the Equipment Exhibition to be held at the International Amphitheatre

	Open	Close
Saturday, Oct. 18	12:00 noon	10:30 p.m.
Sunday, Oct. 19	12:00 noon	10:30 p.m.
Monday, Oct. 20	12:00 noon	10:30 p.m.
Tuesday, Oct. 21	12:00 noon	10:30 p.m.
Wednesday, Oct. 22	12:00 noon	10:30 p.m.
Thursday, Oct. 23	10:00 a.m.	6:00 p.m.
Friday, Oct. 24	10:00 a.m.	6:00 p.m.

THE American Industrial Radium and X-Ray Society, Inc. (the name will be changed to the Society for Nondestructive Testing following the annual meeting) will meet October 22, 23 and 24, to listen to the presentation of some 15 technical papers outlining the various phases of industrial radiographic and X-ray diffraction techniques.

Dr. Leslie W. Ball, director of the testing section, Naval Ordnance Laboratory, White Oak, Md., will deliver the 1947 Lester Lecture. This lecture has been named in honor of Dr. H. H. Lester, senior physicist, Watertown Arsenal, pioneer in the field of industrial radiography in this country. Every other year some outstanding person is selected to give the Lester Lecture and in the alternate years someone is chosen to present the Mehl Lecture, named after Dr. R. F. Mehl, pioneer in the field of gamma ray radiography. Dr. Ball's lecture will be on the subject "Nondestructive Testing in the Design, Manufacture, and Evaluation of Naval Ordnance."

The annual meeting and convention will be held at the Hotel Morrison under the chairmanship of Don M. McCutcheon of the Ford Motor Co., Dearborn, Mich. President of the society is A. F. Cota, A. O. Smith Corp., Milwaukee.

With an intensive technical schedule of some 65 papers to be presented, the American Welding Society has planned its activities to extend over the entire week, October 20 through 24. The subject of welding is indeed to be covered from all aspects what with oxygen producers, welding equipment manufacturers, welding electrode manufacturers and fabricators participating in the technical program. Some 14 categories of welding application and research, including railroad welding, air conditioning and refrigerators, pressure vessels, pipe and maintenance welding, high alloys, resistance welding, cutting, ship structures research, nonferrous, alloy steels, structural, and inert gas welding, to mention a few. All sessions will be held at the Hotel Sherman.

Supplementing the technical sessions on welding, a large segment of the National Metal Exposition will be devoted to the exhibits of welding and cutting equipment and supplies.

G. S. Mikhalapov, Air Reduction Sales Co., will deliver the Adams Lecture Monday evening, October 20, in the ballroom of the Hotel Sherman. His subject will be "Structural Strength of the Welded Joint." The annual banquet will be held Thursday evening, October 23.

President of the American Welding Society is L. W. Delhi, Hunt, Mirk & Co., San Francisco.

The Wire Assn. has announced that its annual convention will be held in Chicago, October 20 through 23. All activities will be conducted at the Hotel LaSalle. The Mordica Memorial Lecture will be delivered by F. Titus Updike, chief engineer, products engineering dept., John A. Roebling's Sons Co., Trenton, N. J.

Selector Chart for Induction Heating and Melting Equipment

THE tabulation below is designed as a quick guide for the selection of induction heating and melting equipment. Prepared by Ajax Electrothermic Corp., Trenton, N. J., the chart is based on engineering data collected since the first applications of high frequency heating and melting in 1916. While the data given here are as accurate as it is possible to present such information, it is pointed out that almost any equipment, if it has sufficient power, can be used in some manner for almost any of the applications listed.

In explaining the use of this chart, Ajax engineers emphasized that for every application there is a "best" type of equipment, based on power and frequency, and it is the purpose of this chart to point out what that best type of equipment is.

Ratings in the chart are on the basis of *A* for most recommended, through *B* and *C* for equipment having some merit, to a dash (—) for equipment not recommended. For applications marked with an asterisk (*), which vary widely with respect to size, shape and temperatures involved, the recommendations cannot be too specific and the ratings are for average applications on which data are available. Generally speaking, the equipment shown in the left hand columns of the tabulation below is best for large pieces, while equipment shown in the right-hand columns is more suitable for small pieces and thin sections.

The chart is copyrighted by Ajax Electrothermic Corp., Trenton, N. J.

Applications	Power Lines	Motor Generators (Some Rectifier Converters below 3000 Cycles)			Spark Gap Converters		Vacuum Tube Converters	
					Mercury-Hydrogen	Quenched		
	Unlimited	20–1200 Kw (up)			3–40 Kw	3–30 Kw	5–100 Kw (up)	
	25–60 Cycles	1000 Cycles	3000 Cycles	10,000 Cycles	20–80 Kc	100–500 Kc	15–1.5 Mc	1.5 Mc (up)
Melting (inc. vacuum and pressure)								
Charges—30 lb and under	—	—	B	A	A	B	—	—
30–300 lb	—	B	A	B	B	—	—	—
300 lb—4 tons and up	—	A	B	—	—	—	—	—
Forging, upsetting, etc.								
Pieces to ½ in. diam	—	—	—	B	A	A	A	C
½ in. to 2 in. diam	—	—	A	A	B	B	B	C
2 in. to 4 in. diam	—	A	B	C	C	—	—	—
4 in. diam and over	—	A	C	—	—	—	—	—
Hardening—Very thin case	—	—	—	—	—	—	A	A
Hardening—Average case								
Pieces to 1 in. diam	—	—	C	A	A	A	A	A
1 in. to 2 in. diam	—	—	B	A	C	B	B	—
2 in. diam and over	—	B	A	A	—	—	—	—
Hardening—Deep case								
2 in. to 4 in. diam	—	A	A	B	B	C	—	—
4 in. diam and over	—	A	B	C	—	—	—	—
Hardening—Through								
Sheet, thin wall tubes	—	—	—	B	A	A	A	B
Pieces to ½ in. diam	—	—	—	B	A	A	A	B
½ in. to 2 in. diam	—	—	A	A	B	B	B	—
2 in. diam and over	—	A	A	B	—	—	—	—
Brazing, soldering, welding								
Small, irregular parts	—	—	—	B	B	A	A	B
Large, regular parts	—	A	A	A	—	—	—	—
Sintering—Carbides	—	A	A	A	A	C	C	—
High temperatures (graphite, etc.)	—	A	A	A	A	C	C	—
Vat and autoclave heating	A	B	B	C	C	C	—	—
Degassing vacuum tubes	—	—	—	—	B	A	A	—
Dielectric heating	—	—	—	—	—	—	—	A
Sheet heating	—	—	—	B	B	B	A	—
Shrink heating *	A	B	B	B	B	B	B	—
Annealing-stress relieving *	A	B	B	B	B	B	B	—
Baking and drying finishes *	A	B	B	B	B	B	B	—
Die heating *	A	B	B	B	B	B	B	—
Muffle heating (nonconductors) *	B	B	B	B	B	B	B	—

Study of a High-

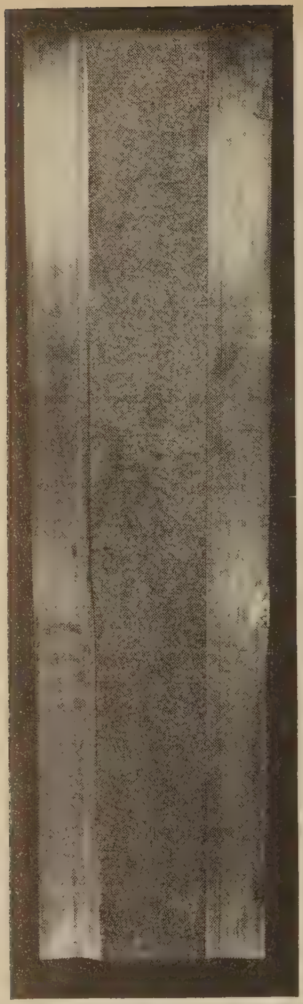


FIG. 1—Fractured surface of the ingot.

THE characteristics of ingots as exemplified by the crystal shapes produced during solidification, the distribution of the important chemical elements and the structural homogeneity have been of vital concern to metallurgists for many years. This concern is well founded because the hot workability and particularly the properties of the finished product can be varied through changes in the forementioned ingot characteristics.

Considerable information has been published relating to plain carbon, low alloy and stainless steel ingots,[1, 2] but precise data concerning highly-alloyed tool steel ingots are exceedingly difficult to find in the literature. The lack of published information on tool steel ingots can be attributed to the cost of conducting such investigations and the fact that the production of tool steels has been considered a highly secretive art to be mentioned only in general terms. In reality tool steels are produced following straight forward metallurgical principles employed to the best possible advantage. This article covers a normal production ingot of 18-4-1 high-speed steel and shows that high alloy content of the steel does not necessarily need to be synonymous with undue segregation.

For many years the quality of ingots has been investigated at the Vanadium-Alloys Steel Co. by the technique of ingot splitting. These investigations have proved to be invaluable in establishing the proper ingot practice for the production of a high quality finished product. The results of one such investigation, extended to include a study of the variation in chemical composition throughout the ingot, is reported in this article.

The ingot under consideration was the fifth of eight ingots cast from a 4-ton basic electric furnace production heat. The mold cavity was 37 in. deep and tapered from 8¼ in. sq at the stool to 10 in. sq at the top. The stripping temperature was about 1700°F. The ingot was slowly cooled and sawed transversely immediately below the hot top. Longitudinal grooves were planed about 2 in. deep on opposite faces and the ingot was split by pounding wedges into these grooves.

Fig. 1 shows the longitudinal fractured surface of the ingot. The grain is uniformly fine and the structure is sound. The ingot fractured ⅛ to ¼ in. from the centerplane and the fracture tends to be flat or slightly convex indicating the absence of central discontinuities.

The fracture was ground off to the centerplane and the ground surface was etched 4 hr in 50 pct HCl, 50 pct H_2O. Fig. 2 is the etched centerplane of the ingot. Etching confirms the general fine grain and soundness. The three cracks along the right hand side of the ingot were caused by the wedges when the ingot was split. Columnar crystallization extends into the ingot for 2 in. with the last ½ in. being a combination of columnar and small equiaxed crystals. Definite columnar crystallization as such is not evident at the bottom, the tendency being for the crystals to be more nearly equiaxed. There does not appear to be a cone of solidification at the bottom as is experienced in ingots of the SAE steels.

TABLE I

Ingot Segregation as Determined by Chemical Analysis

Sample No.	C, Pct	Si, Pct	Mn, Pct	S, Pct	P, Pct	W, Pct	Cr. Pct	V, Pct
1	0.74	0.34	0.24	0.014	0.014	18.00	4.04	1.055
2	0.74	0.32	0.22	0.019	0.014	18.18	4.005	1.06
3	0.755	0.31	0.21	0.015	0.014	17.98	4.04	1.055
4	0.745	0.33	0.22	0.019	0.014	17.94	3.99	1.02
5	0.72	0.33	0.225	0.017	0.013	17.86	4.01	1.06
6	0.725	0.35	0.22	0.016	0.013	17.91	4.02	1.06
7	0.74	0.38	0.21	0.016	0.012	17.80	3.93	1.04
8	0.745	0.36	0.24	0.018	0.017	18.04	4.05	1.03
9	0.75	0.34	0.25	0.015	0.014	17.98	4.02	1.015
10	0.735	0.36	0.245	0.014	0.017	18.02	4.02	1.005
11	0.745	0.33	0.245	0.013	0.015	17.96	4.04	1.015
12	0.74	0.36	0.25	0.012	0.019	18.00	4.10	1.005
13	0.745	0.38	0.255	0.014	0.016	18.10	4.00	1.04
14	0.74	0.34	0.245	0.020	0.017	17.98	4.025	1.025
15	0.75	0.32	0.24	0.019	0.015	17.92	4.00	1.03
16	0.735	0.33	0.24	0.012	0.019	17.96	4.02	1.025
Max	0.76	0.38	0.26	0.019	0.019	18.20	4.10	1.07
Min	0.72	0.31	0.21	0.012	0.012	17.80	3.92	1.00
Ladle	0.735	0.34	0.25	0.016	0.017	18.04	4.07	1.055

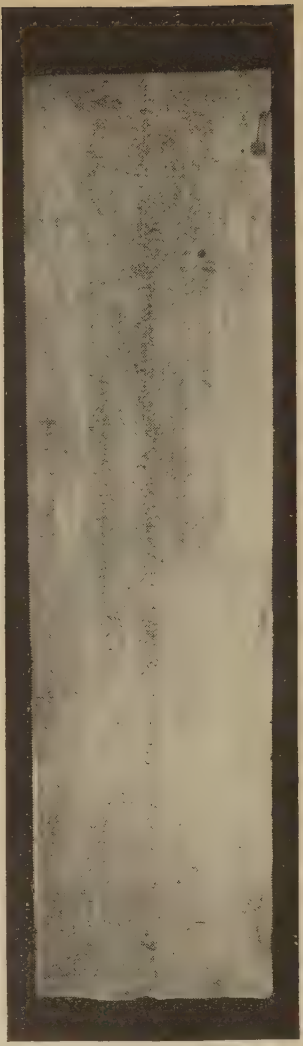
Speed Steel Ingot

Structural analysis, conducted by the technique of ingot splitting, coupled with chemical analysis, reveals some interesting ingot characteristics, such as (1) the crystal pattern, (2) alloy distribution, and (3) structural homogeneity. The author reports the results of such a correlated investigation, in this article, presenting data of a quantitative nature relating to alloy segregation in a normal production ingot of 18-4-1 high-speed steel.

° ° °

By CHARLES F. SAWYER, JR.
Plant Metallurgist,
Vanadium-Alloys Steel Co.,
Latrobe, Pa.

° ° °



° ° °

FIG. 2 — Etched surface of the ingot.

° ° °

That this combination of columnar and equiaxed crystallization is optimum is an open question; however, the remainder of the ingots in this heat worked well and yielded a very satisfactory finished product.

The ingot was sampled for chemical analysis to determine the distribution of the elements. Drillings were taken with a ¾-in. drill at the locations shown in fig. 3. The distance between the samples on the centerline is 6 in. The mid-thickness samples are 2½ in. from the edge and the edge samples are 1 in. in from the edge. Each hole was drilled 1/16 in. below the surface before the sample chips were taken, in order to avoid contamination of the sample by foreign material or etching effects on the surface. Table I gives the chemical analysis of these 16 samples, the maximum and minimum for each element and the ladle analysis. Each analysis was double checked (with the exception of silicon, sulfur, and phosphorus) and the table shows the average at each position.

From the chemical analyses in table I, the segregation in the ingot has been determined. The Bureau of Standards table for the allowable error in chemical analysis[3] was used to establish the limits within which the individual analyses will be expected to fall and analyses outside these limits are interpreted as showing segregation. The ladle analysis (sample was taken between casting the second and third ingots) was used in the formulas of table II to establish the limits.

TABLE II

Determination of Chemical Analysis Limits

Element	Allowable Error	Limits
Carbon	±0.01 + (0.02 × pct C)	0.71 to 0.76
Silicon	±0.02 + (0.02 × pct Si)	0.31 to 0.37
Manganese	±0.02 + (0.02 × pct Mn)	0.225 to 0.275
Sulfur	±0.004 + (0.02 × pct S)	0.012 to 0.020
Phosphorus	±0.004 + (0.02 × pct P)	0.013 to 0.021
Tungsten	±0.05 + (0.01 × pct W)	17.81 to 18.27
Chromium	±0.01 + (0.02 × pct Cr)	3.98 to 4.16
Vanadium	±0.03 + (0.01 × pct V)	1.015 to 1.095

The results for the individual elements are shown in fig. 3 together with the method of numbering the positions sampled. The areas depicting the segregation have been drawn in arbitrarily because the 16 samples analyzed are far too few to outline the areas accurately.

There is no segregation of carbon or sulfur. Chromium, phosphorus and tungsten all show the No. 7 position in the middle of the top of the ingot to be slightly impoverished. The manganese shows inverse segregation in that the center of the ingot from the No. 2 position upward is either slightly below or on the lower limit for this element. Silicon shows positive segregation in the No. 7 position at the middle of the top of the ingot and the No. 13 position one third of the distance from bottom to top at the edge. Vanadium is below the lower limit in positions 12, at the bottom outside and 10, two thirds of

TABLE III

Quantitative Determination of the Segregation of Important Elements in the Ingot, Distribution of Which Is Indicated in Fig. 3.

Element	Position	Variation from the Limits (Pct)
Carbon	......	......
Silicon	7 & 13	+0.01
Manganese	3 & 7	−0.015
	2, 4 & 6	−0.005
Sulfur	.....	
Phosphorus	7	−0.001
Tungsten	7	−0.01
Chromium	7	−0.05
Vanadium	10 & 12	−0.01

the distance from bottom to top midway between the center and outside.

The actual percentages by which the elements showing segregation vary from the limits are given in table III. Segregation, where it exists, is negative for all elements except silicon which segregated positively. In all cases the magnitude of the segregation of the elements is very small and is actually inconsequential. The percentage of carbide per unit volume does not vary significantly throughout this ingot.

References

[1] Committee on the Heterogeneity of Steel Ingots: Several papers starting in vol. CXIII, No. 1, Journal of the Iron & Steel Institute (British), 1926, p. 39.

[2] S. W. Poole and J. A. Rosa. "Segregation in a Large Alloy-Steel Ingot," AIME T. P. 1720, February 1944.

[3] G. E. F. Lundell, J. I. Hoffman and H. A. Bright. "Chemical Analysis of Iron and Steel," John Wiley & Sons, Inc., New York, 1931. p. 129.

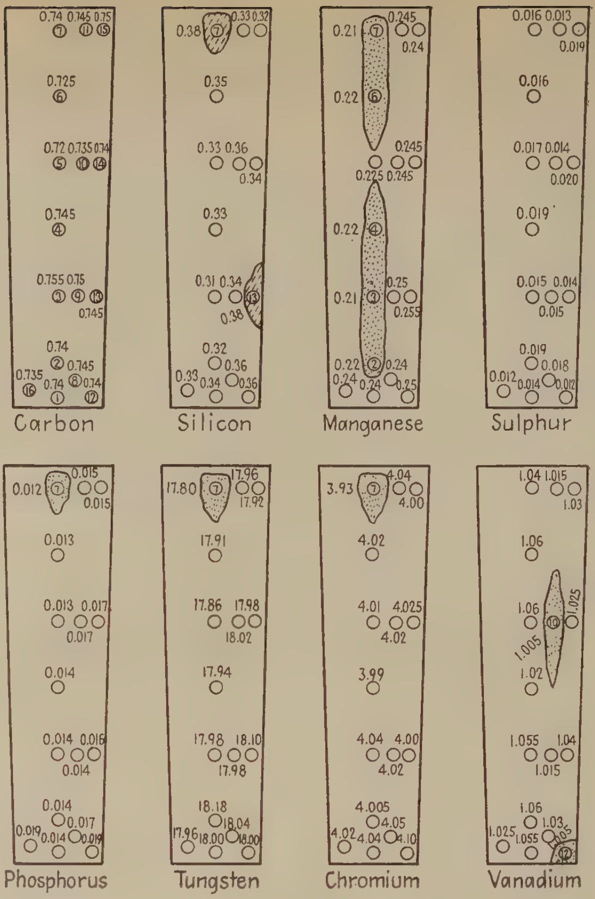

0.74 0.745 0.75
⑦ ⑪ ⑮
0.725 ⑥
0.72 0.735 0.74
⑤ ⑩ ⑭
0.745 ④
0.755 0.75
③ ⑨ ⑬
0.745
0.74 ② 0.745
0.735 ⑯ 0.74 ⑧ 0.74
① ⑫
Carbon
0.38 ⑦ 0.33 0.32
0.35
0.33 0.36 0.34
0.33
0.31 0.34 ⑬ 0.38
0.32 0.36
0.33 0.34 0.36
Silicon
0.21 ⑦ 0.245 0.24
0.22 ⑥
0.245 0.225 0.245
0.22 ④
0.21 ③ 0.25 0.255
0.22 ② 0.24
0.24 0.24 0.25
Manganese
0.016 0.013 0.019
0.016
0.017 0.014 0.020
0.019
0.015 0.014 0.015
0.019 0.018
0.012 0.014 0.012
Sulphur
0.012 ⑦ 0.015 0.015
0.013
0.013 0.017 0.017
0.014
0.014 0.016 0.014
0.014 0.017
0.019 0.014 0.019
Phosphorus
17.80 ⑦ 17.96 17.92
17.91
17.86 17.98 18.02
17.94
17.98 18.10 17.98
18.18 18.04
17.96 18.00 18.00
Tungsten
3.93 ⑦ 4.04 4.00
4.02
4.01 4.025 4.02
3.99
4.04 4.00 4.02
4.005 4.05
4.02 4.04 4.10
Chromium
1.04 1.015 1.03
1.06
1.06 ⑩ 1.025
1.005
1.02
1.055 1.04 1.015
1.06 1.03
1.025 1.055 1.005 ⑫
Vanadium

FIG. 3—Distribution of the important chemical elements in the ingot.

. . . NEW BOOKS . . .

"An Introduction to Metallurgy," by Joseph Newton. The second edition retains the objectives of the first which was to present an introduction to the field of metallurgy as a whole and to provide a foundation for advanced and special studies in metallurgical studies. Discussion of pyrometallurgy has been expanded, as has treatment of corrosion, and a section on powder metallurgy has been added. John Wiley & Sons, Inc., 440 4th Ave., New York 16. 645 p. $5.50.

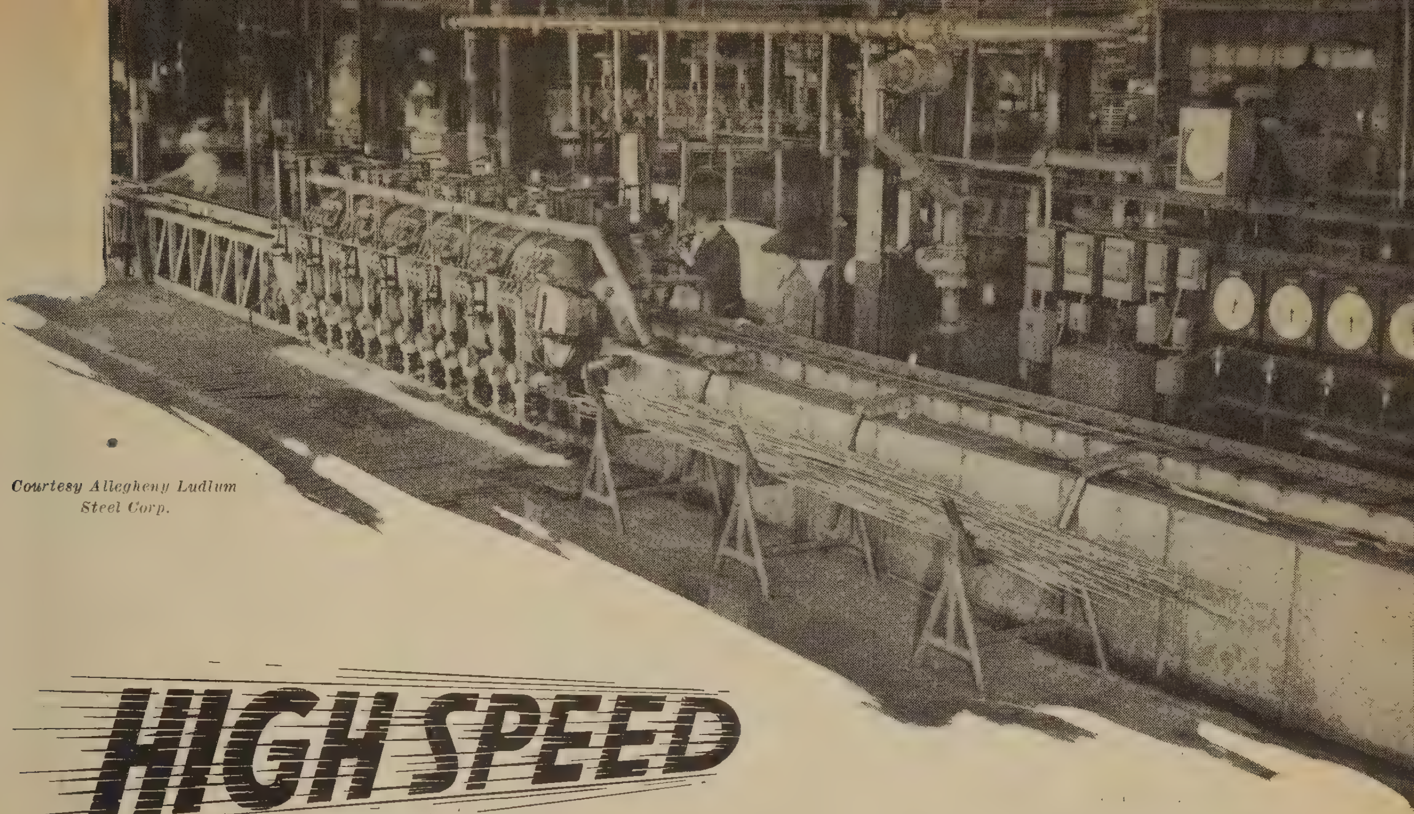
* * *

"OTS Bibliography of Scientific and Industrial Reports." Third volume of index to above reports provides a reference to 13 issues from October 4 to December 27, 1946, inclusive. It also includes a reference to the German patents in chemistry, electronics, scientific instruments, photographic equipment and processes, and transportation equipment which were listed in the Bibliography during this period. Superintendent of Documents, Government Printing Office, Washington, D. C. 35¢.

"Symposium on Foundry Dust Control," by G. A. Boesger, E. A. Carsey, Philip Cohen, C. H. Dohrmann, A. S. Lundy, K. M. Smith. Hoods and piping for control systems, wet and cloth type and centrifugal collectors; fans and exhausters, and maintenance of equipment, are covered in six papers sponsored by AFA safety-hygiene and plant equipment committees. Included in illustrative material are schematic drawings and photographs of installations and components. American Foundrymen's Association, 222 W. Adams St., Chicago 6. $2.50 to nonmembers; $1.00 to members.

* * *

"Lessons in Arc Welding." Third edition has been revised to assist both new and experienced welders as well as persons concerned with the subject with complete and thorough instructions in all phases of arc welding. The book includes 58 lessons and has 228 photographs, illustrations and drawings to supplement the text. Distortion with recommendations regarding its prevention and control is discussed and a section describes the principles of hardfacing. The Lincoln Electric Co., 12818 Coit Road, Cleveland 1. 158 p. 50¢.



Courtesy Allegheny Ludlum Steel Corp.

HIGH SPEED Annealing of Stainless Bars and Tubes

Gas-combustion techniques, based on the ability to generate heat at high rates and permitting precision control over the heat intensity and pattern, have been developed to the extent of making possible a new economic approach to metal heating and heat treating with gas. Utilization of this technique in the annealing of stainless steel bars and stainless steel tubes at Republic Steel Corp. and Allegheny Ludlum Steel Corp., respectively, has resulted in (1) a precise control of metal quality, (2) desired production rates, (3) fuel savings, and (4) improvement in working conditions. The installations at these two plants, described in this article, permit mechanization of the handling of successive charges and result in heating effects being exactly timed and processing being completed at high speeds.

By E. S. KOPECKI
Metallurgical Editor,
THE IRON AGE

° ° °

USE of continuous, high-speed gas heating in the production of stainless steel bars at the Union Drawn Steel Div. of Republic Steel Corp., Massillon, Ohio, and stainless tubes at the Allegheny Ludlum Steel Corp., Brackenridge, Pa., has resulted in an increased production rate and a superior product at substantial savings in manufacturing costs.

The furnace installations at the two plants are similar in construction and in method of operation, except for the fact that four individual furnace units are used for the bar stock, while six units (each of shorter length to prevent sagging) are required to bring the tubing up to temperature at the desired production speeds. The product in both cases enters the furnaces at room temperature, is rapidly brought up to annealing temperature, and then water quenched.

It should be emphasized that the installations described in this article are more or less intermittent or jobbing operations as compared to the 12 ton per hr installation at Babcock and Wilcox Tube Co.[1] This, plus the higher temperatures required for all-stainless charges will, of course, reflect in higher fuel consumption per ton product produced, but nevertheless, when comparing

TABLE I

Variation in Production Rate Stainless Steel Bar Annealing

Bar Diam., In.	Bar Speed, Fpm	Production Rate, Lb per Hr
$\frac{13}{16}$	8.62	910
$1\frac{1}{16}$	5.5	1000
$1\frac{7}{16}$	3.62	1200
$1\frac{13}{16}$	2.7	1420
$2\frac{1}{8}$	1.85	1333
$3\frac{1}{8}$	0.961	1504

the annealing furnaces now in use at Republic and Allegheny Ludlum, with the annealing methods they supplanted, the economic advantages are readily apparent.

The bar annealing furnace at the Republic Steel plant, installed by Selas Corp. of America, Philadelphia, is used primarily for the annealing of stainless steel bars of the austenitic type—AISI 302, 303, 304, 310, 316 and 317—ranging from 5/8 to 3⅛ in. in diam. The output varies, of course, with bar sizes; table I indicates the output rates of some of the typical sizes annealed. It is interesting to note that, as the bar size increases, the production rate increases, so that for 3⅛-in. stock, an output of 1504 lb per hr is realized, as compared with 910 lb per hr for the 13/16 in. size.

A schematic diagram of the layout of the Selas furnace units, and the Brown Instrument Co. air-operated controls, fig. 1, illustrates the flow of air, natural gas, air-natural gas mixture, and compressed air, and indicates the method of operation of this relatively compact, efficient unit.

Each of the four furnace units has an automatic control valve, the operation of which is controlled by compressed air (the construction features shown for furnace unit No. 1 in fig. 1 are applicable also to furnace units Nos. 2, 3 and 4). Brown instruments Nos. 1, 2, 3 and 4 operate in conjunction with Radiamatic pyrometers installed in the roofs of the corresponding furnace units. These four pyrometers sight down on the furnace refractories and read furnace temperature, while instrument No. 5 acts in conjunction with Radiamatic pyrometer No. 5, which sights directly on to the bar as it exits from furnace unit No. 4.

TABLE II

Typical Furnace Temperatures for Annealing Various Size Austenitic Stainless Steel Bars

Bar Diam, In.	Type Steel	Furnace Temperatures, °F Unit 1	Unit 2	Unit 3	Unit 4	Bar Temp Prior Water Quench, °F	Hot Rolled Hardness, Bhn Surface	½ Radius	Annealed Hardness, Bhn Surface	½ Radius
$\frac{13}{16}$	303	2400	2400	2400	2350	2000	..	..	..	..
$1\frac{1}{16}$	303	2400	2400	2400	2350	1950–2000	170	170	160	148
$1\frac{7}{16}$	303	2400	2400	2400	2300	2000	166	159	159	149
$1\frac{13}{16}$	303	2400	2400	2400	2300	2000	174	170	163	156
$2\frac{1}{8}$	303	2400	2400	2400	2300	2000	163	170	159	159
$3\frac{1}{8}$	302	2500	2500	2500	2350	2040–2050	159	156	156	153

This latter reading is the controlling factor, since it indicates the temperature reached by the bar immediately preceding the water quench.

In resuming operations after the weekend shutdown, the turboblower is started up and begins to draw air through the air filter into the air-gas mixer, while natural gas flows into the mixer under a slight pressure. The desired air: gas ratio (10 to 11:1) is obtained by adjusting the rates of flow of the air and gas with the two flowscopes. The air-gas mixture is then drawn through the turboblower and up into the main gas line of each of the four furnace units.

The air-gas mixture flows through the automatic control valve, which is wide open due to the fact that the temperature control instrument has been preset to about 2400°F, and through the header valves into the 12 all-ceramic gas burners in each of the furnace units. These burners are arranged in a symmetric pattern around the inside wall of the cylindrical heating chamber, which is approximately 1 ft ID and 3 ft in length. The temperature builds up in each of the four furnace units until it reaches the preset temperatures, at which time compressed air, which operates the automatic control valve, is automatically decreased in pressure. This action in turn reduces the flow of the air-gas mixture into each of the four units and controls the temperature at the desired instrument setting.

When a cold bar enters the first unit, the temperature in that furnace drops below the control point. When this occurs, the temperature control instrument for furnace unit No. 1 automatically admits compressed air to the control valve, causing it to open; thereby increasing the flow of air-gas mixture to unit No. 1 until the 2400°F temperature is reached. At this point the Radiamatic pyrometer sets into action the mechanism for cutting down air-gas mixture flow in order to maintain the 2400°F reading. As production proceeds, furnace No. 1 will have become sufficiently saturated with heat so that incoming cold bars will have very little effect on the furnace temperature.

The control mechanism just described occurs also in the three subsequent furnaces, although to lesser degrees in units 2, 3 and 4, respectively, in view of the gradual decrease in variation between furnace temperature and bar temperature.

The fast-heating operations described are made possible by gas-combustion techniques which, in many applications besides those concerned with bar stock and tubing, are new to the metals industry. These techniques are based on the ability (1) to generate and liberate heat at rates far beyond those commonly associated with combustion of city gas, natural gas, butane or propane; (2) to provide precision control of the heat intensity and pattern; and (3) to mechanize the handling of successive charges so that

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[1] *"Gas Heating Speeds Seamless Tube Production,"* THE IRON AGE, *June* 5, 1947, *p.* 64.

heating effects are exactly timed and processing is completed at high speeds. From this standpoint, the fast heating of bars and tubing is an example of a new economic approach to metal heating and heat treating with gas. Control of metal quality, production at mill or shop speeds, fuel savings and improvement in working conditions are factors in an overall reduction of costs resulting from the process.*

In practical terms, the process is based on development of a combustion system comprised, principally of (1) fuel-input equipment which controls the ratio of air and gas and compacts or supercharges the mixture for rapid combustion, and (2) ceramic burners which liberate heat from incandescent surfaces and create furnace temperatures ranging from 1300° to 3100°F. These techniques are capable of heat release as high as 40 million Btu per cu ft of combustion space per hr, compared with 200,000 to 400,000 Btu per cu ft of combustion space usually associated with conventional fuel-furnace practice.

A few typical furnace temperature settings for various sizes of bars are listed in table II.

The medium by which the desired annealing temperature is controlled in the various sizes of bars (as reported by Radiamatic pyrometer No. 5) is the speed at which the bars travel. This speed, which can be varied from ½ to 15 fpm, is determined by the speed of the endless chain type conveyor that feeds the bars into the first unit, and by the speed of the pinch rolls located between each of the four heating zones. Pyrometer No. 5, in addition to reporting the temperature of the existing bars, also serves to adjust the bar speed so as to obtain the desired annealing temperature. When the size of the bar stock to be heated is varied, a manual adjustment is made in speed setting. Then if the bar, as it leaves the final furnace unit, is not at the preset temperature, pyrometer No. 5 is capable of causing a variation in bar speed of ±10 pct of the manual setting. In other words, if the bar comes out too hot, the speed will be stepped up accordingly; if the bar is too cold, its production speed will be decreased.

Following the annealing operation, stainless steel bars are either (1) pickled and limed for subsequent cold drawing, or (2) are rough straightened for subsequent turning (or turning and grinding).

Use of high-speed gas heating has resulted in economic advantages in both of these categories, over the floor batch type installation previously utilized.

Whereas a relatively heavy, tightly adhering scale is formed on the bar by batch annealing, scaling in the Selas furnace is negligible. As a matter of fact, the rapid heating and cooling cycles tend to convert the tight scale present on

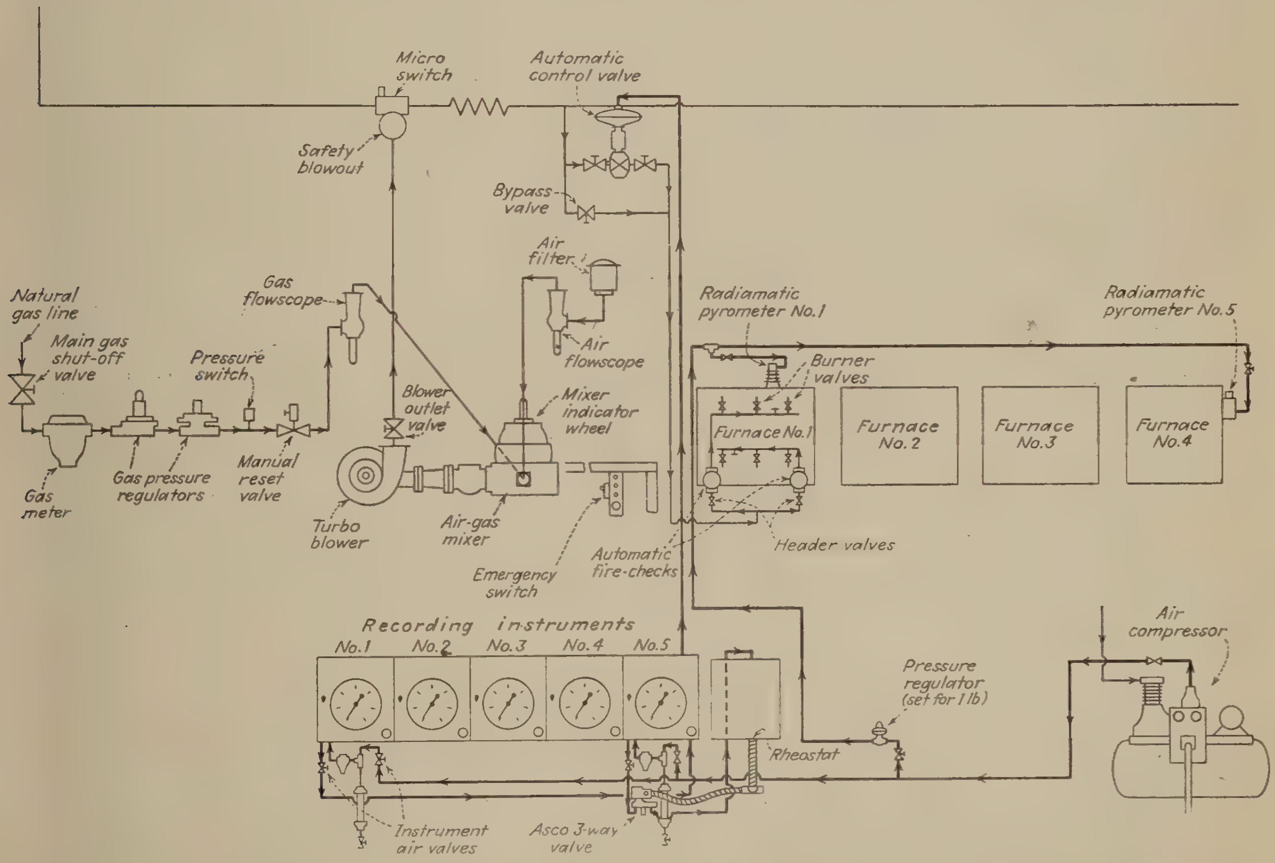
Micro switch
Automatic control valve
Safety blowout
Bypass valve
Air filter
Natural gas line
Gas flowscope
Main gas shut-off valve
Pressure switch
Air flowscope
Blower outlet valve
Mixer indicator wheel
Radiamatic pyrometer No. 1
Burner valves
Radiamatic pyrometer No. 5
Furnace No. 1
Furnace No. 2
Furnace No. 3
Furnace No. 4
Gas meter
Gas pressure regulators
Manual reset valve
Turbo blower
Air-gas mixer
Automatic fire-checks
Header valves
Emergency switch
Recording instruments
No. 1
No. 2
No. 3
No. 4
No. 5
Air compressor
Pressure regulator (set for 1 lb)
Rheostat
Instrument air valves
Asco 3-way valve

FIG. 1—Schematic diagram of layout of Selas furnace units and Brown Instrument Co. air-operated controls, at Republic Steel Corp., Massillon, Ohio.

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* *Gradiation Process—Selas Corp. of America trade name.*

TABLE III

Comparative Operating Data for Stainless Steel Bar Annealing

	Previous Heating Unit	Selas Heating Furnace
Total output, tons	156	203
Total time,* hr	1082	720
Output rate, tons per hr, av.	0.14	0.28

* Includes time during which work load is passing through plus idling time.

the hot rolled bar entering the furnaces into a loose, flaky, scale that can be readily removed. The economy resulting from this is apparent in that pickling operations have been reduced to a fraction of the time formerly required.

In considering the second category, whereby annealed bars are rough straightened for subsequent turning, the continuous, high-speed gas heating installation again makes its presence felt. While batch-type annealing produces a high percentage of bars badly warped and twisted out of shape, and necessitates several passes through the straightening machine, the product from the Selas units is so straight that only a very slight straightening operation is required.

From the photographed installation shown (installed at Allegheny Ludlum Steel Corp.), one might assume that the bar stock and tubes are exposed to the atmosphere during the heating cycle due to the space between each of the furnaces. This is actually not the case, since the hot products of combustion from adjoining furnaces are of sufficient length as to merge and form a blanket over the bar (or tube) surfaces. The furnaces are purposely built in short sections—especially so in the case of tubing—with guide rolls installed between the furnaces, to minimize sagging.

TABLE IV

Typical Operating Conditions for Annealing Type 304 Stainless Tubing of Various Sizes

Tube Size, OD, In.	Tube Wall Thickness, In.	Average Tube Travel, Ft per Min	Production Rate, Lb per Hr
¼	0.037	41	209
¼	0.047	32	195
½	0.065	28	663
½	0.125	8	240
¾	0.049	25½	490
¾	0.083	17	492
1	0.035	22	490
1	0.187	6	567
1½	0.065	11½	696
1½	0.125	8	890
2	0.065	16	1140
2	0.109	7½	939
2½	0.180	5	1238
2½	0.200	4½	1172
3	0.065	10	1225
3	0.109	5½	1150

It should be mentioned that the batch type furnace with which the Selas assembly is being compared, is still in use at Republic Steel. With all bars in sizes from ⅝ to 3⅛ in. in diam currently handled by the Selas units—the installation was originally designed to anneal bars up to 3 in. in diam—the batch-type installation is utilized in annealing bars larger than 3⅛ in. (production of which is only a fraction of the smaller sizes) and other miscellaneous parts.

Hence, although a direct, quantitative comparison between the two methods is impossible, an indication of the relative economic merits is permissible. Such a study is shown in table III. The data shows that while gas consumption of the Selas furnace was twice that of the batch-type unit, the average tonnage output per hour of the former unit was exactly twice that of the batch unit. The data, as such, shows that the continuous, high-speed gas heating installation is at least on a par with the batch-type furnace.

There are, however, several factors—in favor of the high speed gas unit—that do not appear in the operating data but must nevertheless be considered.

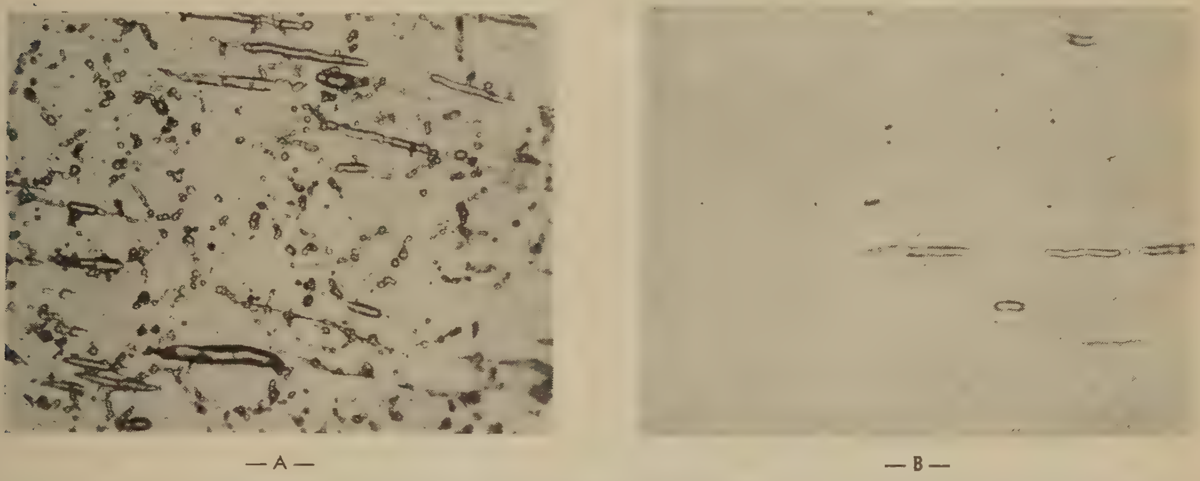
First, the continuous annealing furnace is in use five 8-hr turns per week, while the batch-type unit, due to its limited performance, is used intermittently. In other words, the batch-type unit is completely shut down for days at a time, while the Selas unit is idled at about 1800°F, 16 hr, for every 8 hr (5 days per week) that it is active in annealing bars. Since the time figure in table III includes the idling time as well as operating time, the fuel consumption data are indeed deceptive. Further, even when in operation, the batch-type unit is frequently used at temperatures much below the requirements of the high-speed unit.

Second, labor cost is also influenced. At the time that the batch-type furnace was used for the production now handled by the Selas unit, the operation required the use of three or four men—depending upon the bar size—and was extremely hazardous. Today, the Selas furnace performs the job at twice the production rate under the direction of one operator.

An annealing furnace, like any other production tool, must be successful in turning out parts that meet certain rigid specifications, else the economic, high production and any other desirable features it possesses are of no consequence. Annealing of stainless steel bars has a two-fold purpose; (1) to produce a homogeneous metallurgical structure (with the carbides in solution), and (2) to produce a soft annealed bar for subsequent working (cold drawing) or machining operations.

Since the rapid rate of heating and cooling and the short time at temperature in the high-speed gas unit does raise the question as to whether the grain boundary carbides initially present in the hot rolled bar are dissolved into the austenite, the metallurgical department at Republic Steel Corp. conducted a series of metallographic studies to determine the annealing results being obtained. In one test, five hot rolled austenitic type stainless steel bars of various sizes were examined metallographically before and after annealing, see figs. 2, 3, 4, 5 and 6. The annealing results for the 1 1/16 in. bar, fig. 2, were so impressive, that the four larger bars were sensitized prior to annealing. The dense concentration of carbides in the grain boundaries resulting from the sensitizing treatment is readily apparent in the photomicrographs, as is also the effectiveness of the anneal in diffusing the carbides into the matrix.

The effectiveness of the annealing treatment from the standpoint of attaining softness for subsequent drawing or machining operations is further indicated in table II by a comparison of hardness values of various sizes of hot rolled bars before and after annealing. The values shown are considerably less than called for by specifications.


—A—

—B—

FIG. 2—Photomicrographs of (A) hot rolled and (B) hot rolled and annealed, 1 1/16 in. round type 303 stainless steel. Note removal of carbides in grain boundaries by annealing treatment (B). Sodium cyanide (10 pct) etch; 500X.

Success of the anneal is necessarily just as dependent on the cooling operation as on the heating cycle. It is of no avail to insure diffusion of the carbides into the austenitic matrix if these carbides will again reappear due to an inadequate quench. The quenching ring, which is located immediately beyond the last furnace unit has been designed so as to cool to black heat temperature in just a few inches of bar (or tube) travel. The angle and velocity of the quench water are such as to prevent formation of a vapor layer alongside the metal surface. Further, the water envelopes the bar (or tube) uniformly around its circumference and follows the bar (or tube) travel for a short distance.

Cross-checking has shown that the metallurgical results are consistently uniform not only from end to end of any one bar, but also from bar to bar. This is understandable from the nature in which the annealing operation is performed. The "production line" effect of the Selas installation tends to obscure the fact that each bar is considered and treated as an individual, rather than as "one in a crowd," which is the case in batch annealing.

Space saving is another desirable feature of the high-speed gas heating installation as evidenced by the fact that the standard length of the bars annealed in the four furnace units, which measure about 14 ft in length, overall, is 22 ft.

Maintenance costs of the furnace units appear to be quite insignificant inasmuch as no major repairs have been required in 15 months operations. This is a very important factor since the advantages of continuous, semi-automatic tools, such as the annealing furnace under discussion, are to no avail if frequent or even infrequent breakdowns occur.

The installation at Allegheny Ludlum, although essentially the same as at Republic Steel, does offer a few variations in operating and handling technique, since tubes, rather than solid bars, are annealed.

Six furnace units are operated in series, annealing many types of stainless steel tubes—types 303, 304, 308, 310, 316, 317, 321, 347, 410, 414 and 446 are typical—at speeds ranging from practically zero to 41 fpm. This increase in speed (over solid bars) does present a difference in handling procedure, since a production rate of about 800 lb per hr of thin wall tubing constitutes a great deal more mass than does 1000 lb per hr of solid bars.

The Selas furnace is in continuous operation 18-8 hr turns per week, and is shut down every weekend from midnight Saturday to 4:00 pm Sunday. The furnace is operated by a heater on each turn who checks the furnace operation, regulates speed control, records pertinent operating data, and makes occasional hardness checks to determine the suitability of the anneal. Three men, working two at a time, handle the charging and discharging operations, although plans have already been made for the installation of an automatic discharge unit, which will further reduce labor costs.

Here again, as in the case of solid bars, straightening and pickling operations play an important role in the production procedure. Use of the Selas installation has made possible substantial savings as compared with the batch type method previously employed. The straightening operation has been stepped up considerably, inasmuch as only about 50 pct of the tubes produced require rough straightening. Pickling operations, which formerly required about 1 to 1½ hr, have been reduced to about 15 to 20 min.

Furthermore, the batch type method previously used caused rejections due to surface difficulties and nonuniformity in heating. Pulling tubes out the batch type unit frequently resulted in scratched surfaces, while nonuniform heating sometimes caused "hot spots" on the tubes. This interfered with efficient pickling, since the scale formation at these hot spot locations was greater than anywhere along the tube, and required special attention or immediate rejection.

Another feature that has been received with enthusiasm at Allegheny Ludlum is the fact that the continuous heating unit has reduced considerably the metal loss due to scaling. With approximately 0.0015 to 0.003 in. in thickness conserved per tube, weekly savings are quite large. A recent spot check conducted on 1½-in. OD x 0.065 in. thickness tubing showed that with the batch anneal the metal loss was 5½ lb, 2.03 pct; while with the high-speed method, the loss was only 2 lb, or 0.74 pct.

It is interesting to note that the plant men refer to the "oxide discoloration" on the tubing

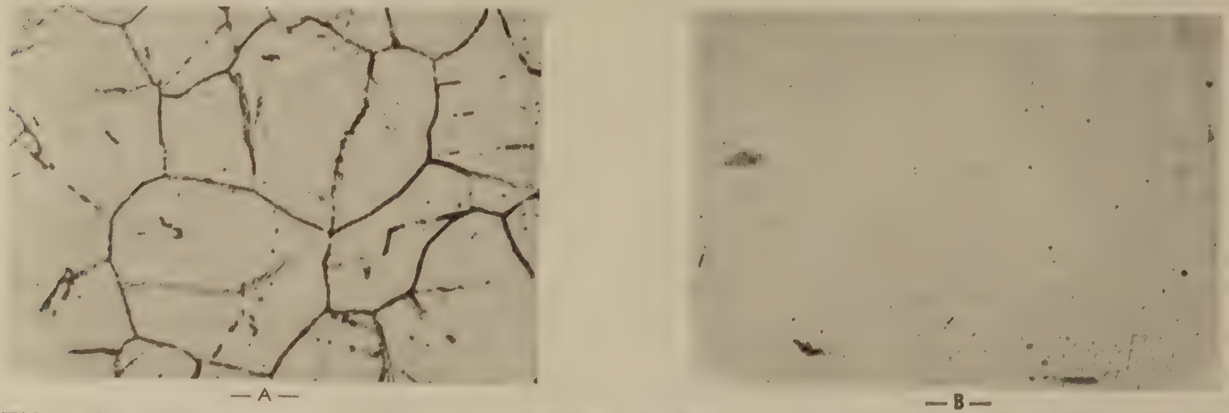

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FIG. 3—Type 303 stainless, bar size 1 7/16 in. (A) represents hot rolled bar, sensitized at 1500°F for 5 hr, furnace cooled to 1100°F. (B) indicates suitability of the anneal by showing disappearance of grain boundary carbides. Sodium cyanide (10 pct) etch; 500X.

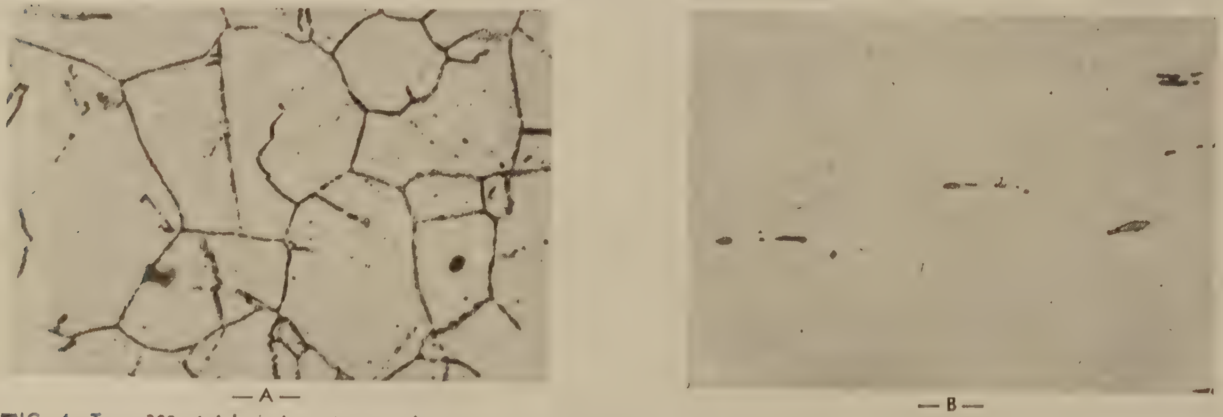
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FIG. 4—Type 303 stainless, bar size 1 13/16 in. (A) represents hot rolled bar, sensitized at 1500°F for 5 hr, furnace cooled to 1100°F. (B) indicates suitability of the anneal by showing disappearance of grain boundary carbides. Sodium cyanide (10 pct) etch; 500X.

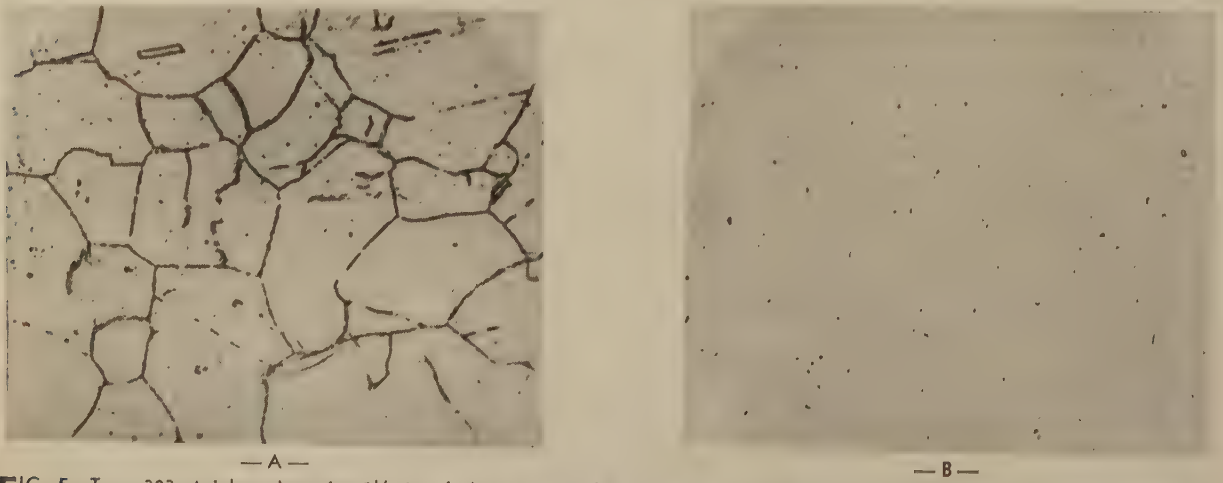
— A —

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FIG. 5—Type 303 stainless, bar size 2⅛ in. (A) represents hot rolled bar, sensitized at 1500°F for 5 hr, furnace cooled to 1100°F. (B) indicates suitability of the anneal by showing disappearance of grain boundary carbides. Sodium cyanide (10 pct) etch; 500X.

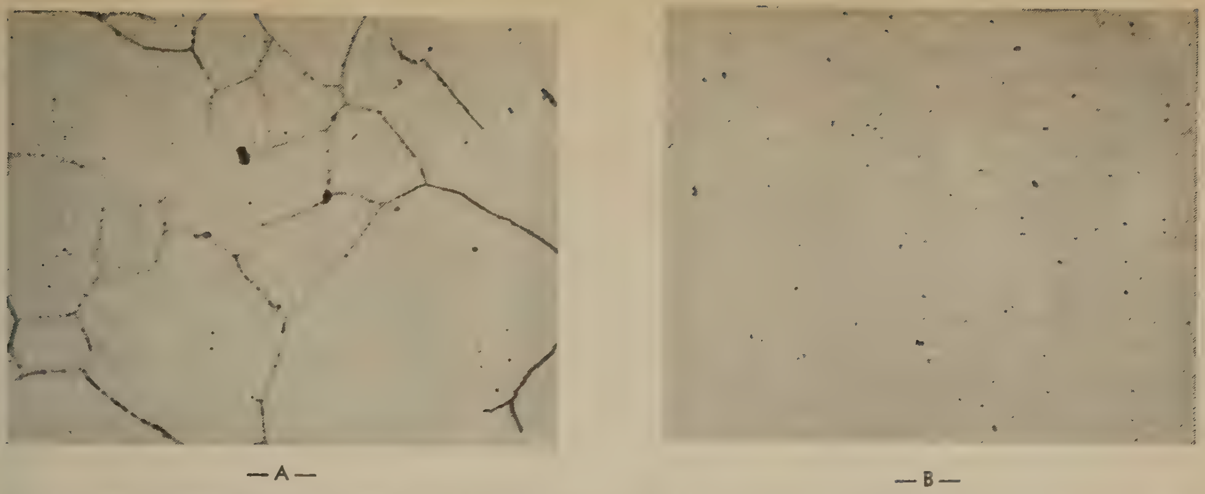

FIG. 6—Type 302 stainless, bar size 3⅛ in. (A) represents hot rolled bar, sensitized at 1300°F for 10 hr, furnace cooled. (B) indicates suitability of the anneal by showing disappearance of grain boundary carbides. Sodium cyanide (10 pct) etch; 500X.

after annealing, rather than to "scale."

Suitability of the anneal, as determined by hardness checks, is of vital importance to Allegheny Ludlum, with tubes being annealed between every cold drawing cycle. Each tube therefore passes through the Selas furnace a number of times depending upon the type of steel involved and the specifications to be met. Under this arrangement, the improvement in production efficiency obtained as a result of the closer and more uniform hardness control in the anneal, is readily apparent to the operator.

Table IV shows some interesting operating conditions for annealing type 304 stainless steel tubing. The wall thicknesses listed for each of the tube sizes represent normal production minimum and maximum values. It is interesting to observe the higher output obtainable as the tube size increases. This is due of course to the fact that the greater surface of the larger tubes makes possible greater heat absorption from the intense heat value available. A typical temperature cycle for obtaining 1950°F in the exiting tube (prior to quench) is: unit No. 1—2450°F, No. 2—2450°F, No. 3—2400°F, No. 4—2350°F, No. 5—2200°F, and No. 6—2200°F.

The saving in floor space occupied by the continuous, high-speed gas heating installation is also worthy of mention, inasmuch as tubes, varying from 5 to 42 ft in length are annealed in this series of six units which occupy only 15 ft in overall length. The furnace chamber of each of the units is 13¼ in., and the length 12 in.

Allegheny Ludlum has not as yet accumulated detailed comparable fuel consumption data for the old and new annealing installations, although the plant men have observed that the fuel consumption is about equal for the two methods. This indeed speaks well for the new unit, since what with savings in labor costs, straightening and pickling costs, not only is the production cost lowered, but a higher quality product is obtained.

Electric Smelting v. the Blast Furnace

THE development of electric smelting furnaces is outlined, with special reference to the low shaft furnace, in a paper "Electric Smelting," by R. Durrer presented at the recent Switzerland meeting of the Iron and Steel Institute, according to *Metallurgia,* August 1947. The reactions taking place in electric smelting are discussed and compared with those of the blast furnace, particular consideration being given to the energy consumption in the two types of furnaces.

In considering the possibilities of the future development of electric smelting, Durrer points out that electric smelting is one of the rare examples in which the efficiency of both types of energy is about the same; strictly speaking, coal is even slightly superior. It would thus be a mistake to use hydro-electric power for smelting in the place of coal, while there is still the possibility of replacing coal in cases in which it is not utilized so efficiently as electrical energy.

Even though electric smelting is on the whole restricted to comparatively narrow limits, in certain regions there is the possibility of remarkable development. This can be enhanced by adapting the energy consumption to local conditions and by using low quality, inexpensive material. It is likely that electric smelting will extend also to other districts as soon as it becomes possible to lower the energy consumption appreciably and to use any quality of coal. A condition for this is the complete utilization of the coal, i.e., the complete combustion of carbon to carbon dioxide.

A development of this kind was initiated by Wiberg, who adapted his sponge iron process to the use of electric furnaces; but even so the energy consumption is said to amount to about 1500 kw-hr per ton. Another promising attempt consists in the use of the open low-shaft furnace with the introduction of blast just below the top, which causes the combustion of the rising gases.

FLASH WELDING

Theory and Practice

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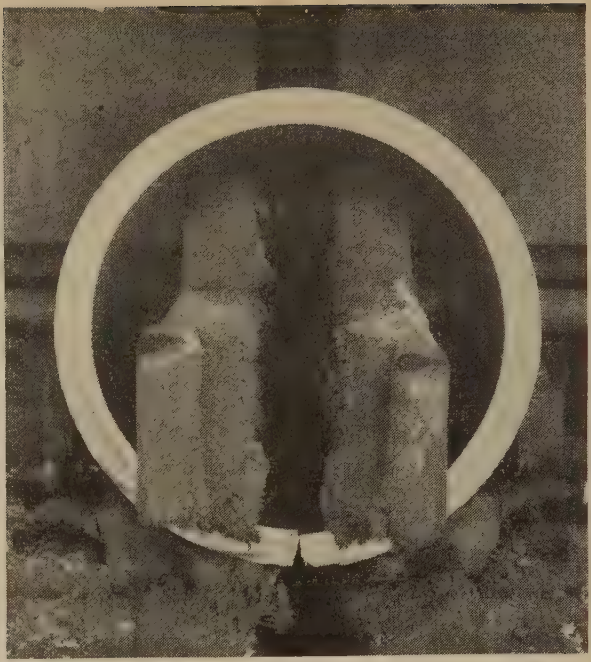


FIG. 1—Method of clamping the ends of a steel ring for flash welding. Note the amount of overhang and the gap between the ends.

One of the most widely used types of resistance welding, flash-butt welding, can be applied successfully to the joining of most kinds of materials, and is particularly suited to high production work because of the speed and economy of operation. The principle on which this method of welding operates and the technique of its application to materials of various kinds and thicknesses are described herein.

OF all the resistance welding processes used, flash-butt welding is probably the one process that has been accepted by engineers and production men, without question, for a number of years. It is extremely reliable, and if a few reasonable precautions are taken, very few difficulties are encountered. As the name implies, flash-butt welding is a means of making butt welds and is classified under the resistance welding processes. Upset-butt welding, also a type of resistance butt-welding, has certain limitations. It is not as efficient, for instance, for welding large sections, because the size of equipment involved requires more preparation, and so does not have as wide a general field of application as flash-butt welding. Upset-butt welding, therefore, has been relegated to the field of very special applications.

The resistance butt-welding processes are sometimes compared to the weld produced by a blacksmith, when the parts to be welded are heated to a temperature within the plastic range and then hammered or forged to produce a weld.

In flash-butt welding, usually referred to as flash welding, the heating of the material is done by the flashing action of rapidly occurring short circuits of high electrical currents, this heating action being followed by a heavy forging pressure produced by mechanical or hydraulic methods called the upset.

The blacksmith, of course, confines his method of welding to low carbon steel or wrought iron, while the flash welding process is used over a great range of ferrous and nonferrous alloys. It is necessary to remember, however, that this is a butt welding process and its applications are limited to making butt welds.

Various terms have come into use to describe the action that takes place during the flash welding operation. Burn-off is the metal lost during the flashing cycle or heating cycle. Upset is the amount of material that is lost during the upsetting, when the plastic metal is pushed together and the weld made. Material lost is the total amount of material used or lost in making the weld, and is equal to burn-off plus upset. Upsetting pressure is the pressure exerted on the movable platen during upsetting, when the weld is made. Flash is the metal thrown out during the flashing action, and is also used to designate the metal extruded during the upsetting operation. Flashing current flows while the flashing action is taking place. Lower die is the current carrying member of the clamp. Upper die or clamp exerts clamping pressure on lower die, and may or may not carry current. Material extension or material overhang is the amount by which the unsupported material overhangs the dies or clamps.

All flash welding operations are similar in that they have the heating or flashing cycle, which is sometimes preceded by a preheating period, the flashing cycle being followed by the upsetting period which in turn may be followed by a postheating cycle. All flash welding applications do not require all these cycles of heating, and all machines are not equipped to perform all of them. The only two cycles that are identified with all flash welding applications are the flashing and upsetting.

The heat in flash welding is generated when the parts to be welded are clamped as shown in fig. 1 and the current passed through with sufficient material overhanging the dies to allow for burn-off and upset.

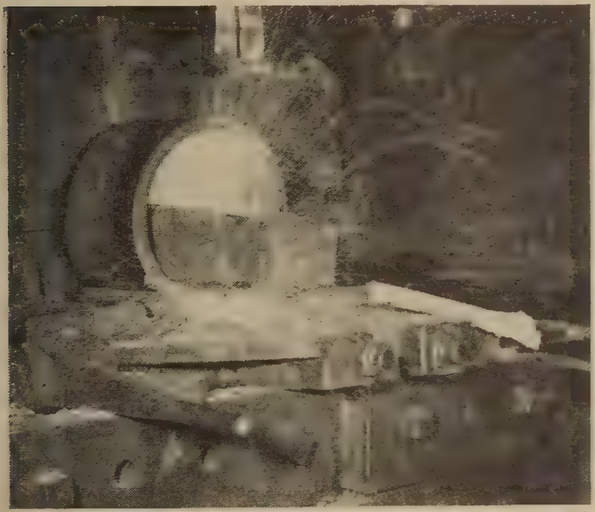


FIG. 2—Actual flash weld in process. The process is characterized by a rapid and continuous discharge of sparks.

The pieces to be welded are brought together slowly under light pressure, with the welding transformer energized so that there is an electrical potential between the two parts. As these two parts touch, there is localized heating between the touching irregular surfaces which raises these surfaces to a temperature above the melting point. This molten metal is expelled in the form of sparks, and the burning away of the high spots of the irregular surfaces, causing the arcing area to be increased and the flashing to be intensified, is shown in fig. 2.

While this metal is being expelled and more arcs are being formed, the parts are continually moving together so as to maintain the flashing gap. As more and more arcs are formed and as metal is being burned off and the flashing action increased, heat is progressively generated back of the flashing area. When this area extends far enough and the correct temperature is reached, the parts are moved quickly together and the weld is made. Fig. 3 shows the upset area of the completed weld.

Fig. 4 shows a diagram of the flash welding operation. Preheating and postheating cycles are shown on this chart, along with the flashing and upsetting cycles. The chart is self-explanatory as to sequence of cycles.

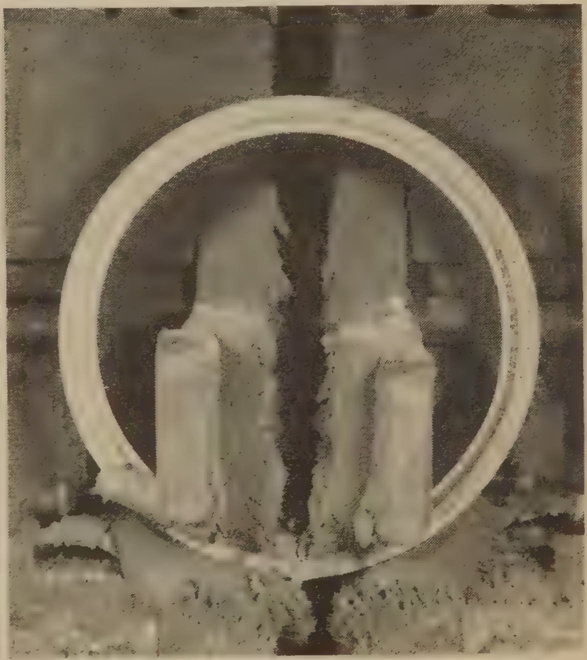
Allowing the current to flow for a short period during the upset time insures a cleaner weld with less voids. The length of time the current is allowed to flow during the upset period is determined by the cross-section being welded. The greater the cross-section area, the longer the current may flow during the upset. If the time the current flows during the upset is unduly prolonged, the weld may be partly burned and the resulting bond may be weak.

The speed of upset is very important in successful flash welding, and cannot be overemphasized. This speed is determined by the characteristics of the machine in the inertia of the mass of the platen, etc. When welding such alloys as aluminum, proper control of the speed of upset may mean failure or success of the weld.

While the flashing period serves the purpose only of heating the parts to be welded to a temperature in the plastic range, the time of flashing is closely related to the area to be welded. It is obvious that the energy of heating might be applied in either a short or a long time.

In welding heavy sections, a high flashing rate or high energy input allows the heat to be lost rapidly by radiation, and does not allow the heat

FIG. 3—Completed flash weld showing the amount of upset material.



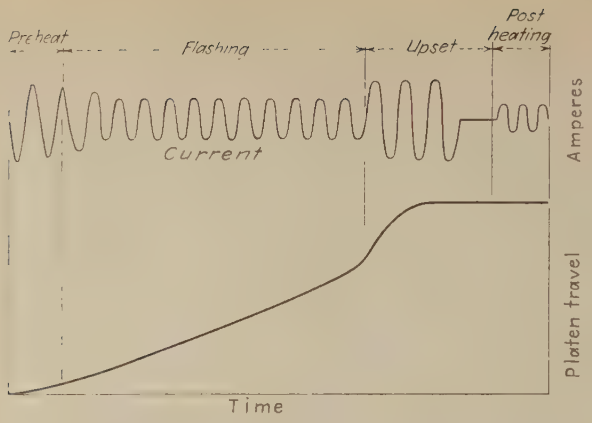


FIG. 4—Diagram of a complete flash-welding operation including the preheat, flashing, upset and postheating cycles, and the relative time and platen travel of each.

time to conduct into the work back of the flashing area. Such welds may be more critical to make, and lack of subsequent increased plastic area may cause more voids and unfused areas than a weld made with less energy and at a slower rate.

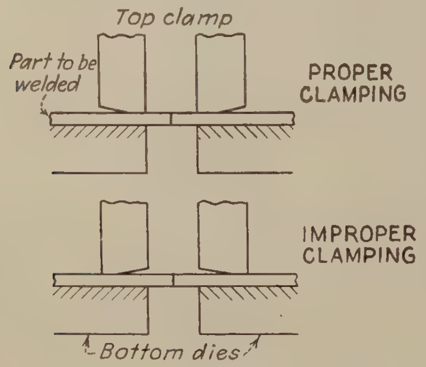
When welding thin sections, a prolonged heating period may cause the heated area to become too large, and the thin section may buckle when the upset pressure is applied. As a general rule, heavy sections are welded at a slow enough rate to allow the heat to soak back of the flash, and thin sections are welded at a fast rate with a narrow range of heated area.

There is also another essential that enters into the technique of flash welding, namely, material overhang. As the flash-welding dies are water-cooled, and as the resistance of the material that overhangs the dies generates some heat, too little or too much overhang may affect the weld. The material overhang is not too important when welding heavy material as long as the overhang is sufficient for the burn-off and upset; heavy sections can support themselves readily. However, when flash welding thin sections, if too great a material overhang is used, the material will buckle when the weld is upset.

Flash Welding Equipment

A flash welding machine consists essentially of a frame on which are mounted a stationary platen and a movable platen, and, mounted in the frame as close to platens as possible, the welding transformer. One terminal of the secondary of the welding transformer is connected to the stationary, and the other terminal is connected to the movable platen by means of flexible shunts.

FIG. 6—When welding thin materials, it is essential that the clamping take place close to the edge of the lower dies. Improper clamping will not give adequate support to take the upset pressure.



The motion of the movable platen is controlled by some mechanical or hydraulic method, so that the speed of the moving platen can be adjusted to maintain the proper gap between the parts during the flashing operation. The upset mechanism is coupled with and is a part of the method of controlling the movement of the moving platen. These flash welding machines may be horizontal or vertical, depending upon the application.

In a mechanically operated machine the platen moves forward at a speed determined by the contour of the flashing cam and the speed of the shaft on which it is mounted. The amount of upset is determined by an upset block mounted on the flashing cam. The current cut-off and motor cut-off cams are set to operate in the proper relationship with the upset lug, so the current can be cut off at the proper time and the motor stopped. These machines have either a manual or air platen return.

Mechanically driven cam-operated flash welders are suitable for repetitive welding of similar parts and are limited as to the area that can be upset. To overcome this disadvantage and still retain the desirable feature of automatic control, the welding machine manufacturers have developed a line of automatic flash welders that control the flashing and upsetting cycles hydraulically.

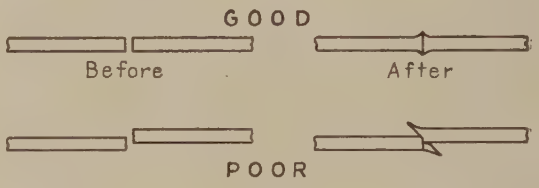


FIG. 5—Sketch showing the effects of good and poor alignment on the finished flash weld.

To make good butt welds by the flash welding process, it is essential that the parts be aligned and be held in alignment. Fig. 5 illustrates what is meant by good alignment and the results of poor alignment. The thinner the metal, the less misalignment that can be tolerated. When welding thin metal, it is also essential that the clamping be close to the edge of the lower dies as shown in fig. 6. If the clamping is at the back instead of the front of the clamp, the metal is not supported sufficiently to take the upset pressure.

Clamping of cylinders usually presents a problem for the machine manufacturer, as there is no back-up and it is necessary to depend on the clamping pressure to prevent slippage during the upset. Fig. 7 shows an alligator-type clamp for clamping light cylinders about 8 in. long.

The two hand toggle clamps in the front are for aligning the edges of the cylinders.

Electrical Characteristics

The construction of welding transformers for the flash welding machine is similar to transformers for resistance spot welders. The primary and secondary coils are mounted adjacent on an H-type laminated iron core. The secondary is usually water cooled. A number of steps of heat are provided by means of a tap-changing switch, connected to taps on the primary windings.

A flash welding transformer is designed with a drooping characteristic, i.e. the secondary voltage decreases as the current increases. Thus, as the resistance of the circuit increases or decreases due to the flashing action, the change in flashing current is not as abrupt.

Since the energy at the point of flashing is proportioned to the current squared, any great increase in current can cause violent and erratic flashing. It is desirable that the flashing action be constant and continuous, rather than occasional and violent. Too violent a flashing action will expel large gobs of metal, which cause large craters that may form voids in the finished weld, since they are not closed up in the upsetting operation.

When welding very heavy sections, there may be some difficulty in starting the flashing cycle. On such applications it may be desirable to have a high secondary voltage to start the weld more easily, but if this voltage setting is maintained throughout the flashing cycle, the flashing may be too violent and the metal may be burned off more rapidly than the heat has time to spread back into the metal.

In such cases it is necessary to provide a dual voltage control by changing the voltage applied to the welding transformer primary. This may be accomplished on a machine equipped with tapped transformer by using a magnetic contactor to shift from a higher to a lower tap. If electronic contactors are used with a heat control which allows the current to start flowing at a predetermined point on the voltage wave, the flashing may be started at 100 pct heat, and as the flashing progresses a transfer is made to a lower heat control setting. Any of these systems can be used for controlling the values for preheating and upsetting currents.

As the flashing cycle exists for a sole purpose of heating the metal prior to the upset, the amount of burn-off and the metal used in the upsetting depends upon the cross-section area of the parts being welded and on the shape of the parts. The greater the area and the more concentrated the area, the more metal required for burn-off and upset. Table 1 gives some typical allowances.

Flash welding, being a butt welding process, is confined to making butt welds or at least confined to sections where a heat balance can be obtained in both pieces. Flash welding of rounds and squares, sheet, tubing, etc., is easily done but there is always some applications that require special preparation.

Such typical applications are shown in fig. 8. At A is shown a boss machined on the larger section to match the smaller section. The boss should be long enough to allow for burn-off and upset. Fig. 8B shows an application in sheet metal where the larger piece is trimmed to match the area of the smaller piece. Fig. 8C shows suggested preparation for sheet metal.

Flash welding is a process that can be used for a large variety of applications. The welds produced by this process are equal to the strength of the parent metal, and the welds more nearly approach the properties of the parent metal than do those produced by any other welding process. No other welding process can compete with flash welding as to speed of welding when the economic considerations warrant its use.

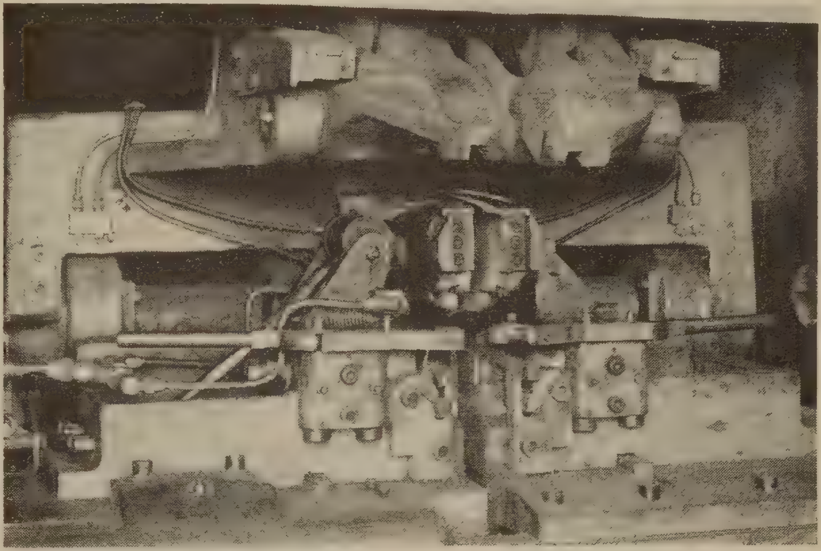


FIG. 7—Alligator type of clamp is used for clamping light cylinders. Hand toggle clamps at front are used for aligning the edges.

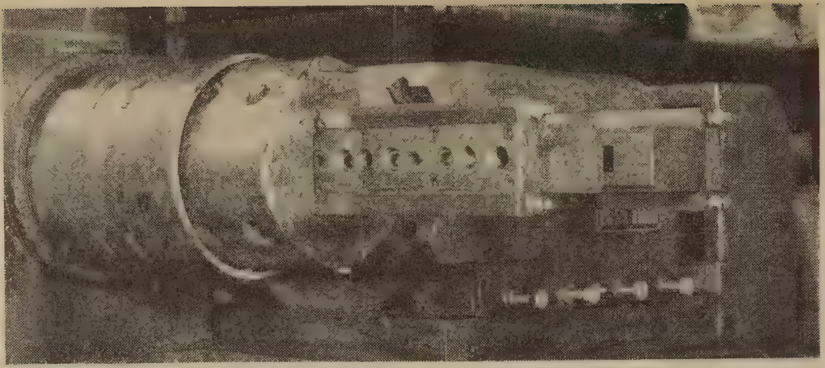
Removal of Welding Flash

The removal of the upset or flash produced in the flash-welding application has always presented a problem. In sheet metal applications under 1/16 in. thick, this is easily accomplished with a flat cup grinder and sander, but as the thickness increases the amount of upset increases.

Several welding machine manufacturers working with machine tool builders have developed a very efficient line of machines modeled after a broaching machine to remove this flash. A typical machine built for removing flash from flash-welded cylinders is shown in fig. 9. This machine removes the flash from the inside and outside of

RIGHT

FIG. 9—Special machine for removing the flash from the inside and outside of small cylinders simultaneously.



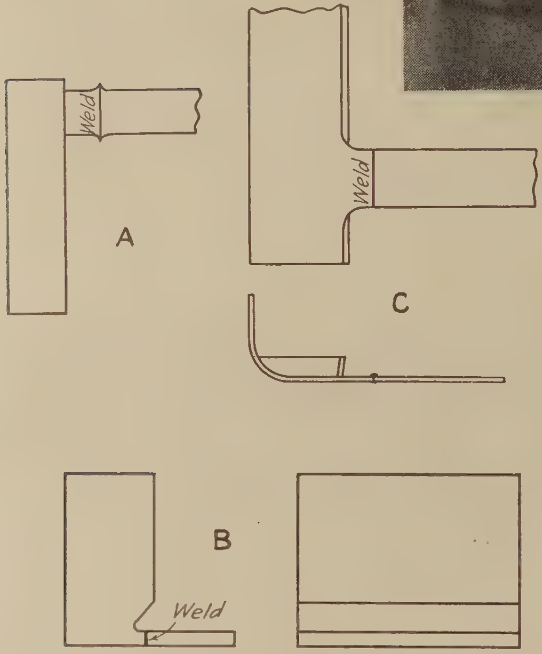


FIG. 8—When welding materials of different thicknesses, it is essential to design the weld area to give proper heat balance between the two parts.

the weld in one operation. Such equipment as shown is usually adaptable to parts that are similar in shape, such as cylinders.

The old fashioned hand air hammer and chisel is also very effective in removing flash from parts. This is particularly effective if the flash can be removed while the metal is still hot.

Several methods have been tried to prevent the flash from forming on one side of the joint and forcing it to appear on the other side. This has never been very successful, as there is a chance of impurities being trapped in the weld.

Not all metals can be flash welded, copper being one material that is usually avoided by users since the metal is such a good conductor of heat that it is difficult to maintain sufficient heat to secure adequate flashing. This metal, however, can be and is butt welded by the upset butt-welding process.

Aluminum can be flash welded very successfully, providing the flash welding machine has a very fast upsetting time. As shown in table II the strength of the material after heat treating is as good in the weld as in the parent metal.

Alloy steels and stainless steel can be flash welded, it being common practice to flash weld wire supports for stainless-steel refrigerator shelves.

Some high zinc brasses are difficult to flash weld since the zinc is burned out during the flashing period.

Almost all types of steels can be flash welded to their own types and to other types. However, precautions must be taken when welding high alloy steels to prevent cracking.

Flash welding is a process that has a wide variety of applications and is used for high production work, and produces a weld equal in quality to any other welding process used. It is limited to the making of butt welds, and requires relatively expensive equipment. Like every process requiring special machines, the quantity involved must be of sufficient quantity to justify the cost of the equipment. The process is very fast and the quantities produced per hour are high. It requires little operator skill, the equipment is simple and rugged, and where it can be applied, it pays for itself handsomely.

TABLE I

Upset and Burn-Off Allowances for Various Areas

Size	Burn-off	Upset
1⅝ x 10 in.	1 in.	½ in.
⅞ x 10 in.	⅝ in.	⅜ in.
0.040 x 3 in.	⅛ in.	¹⁄₁₆ in.

TABLE II

Relative Strength of Weld and Parent Metal

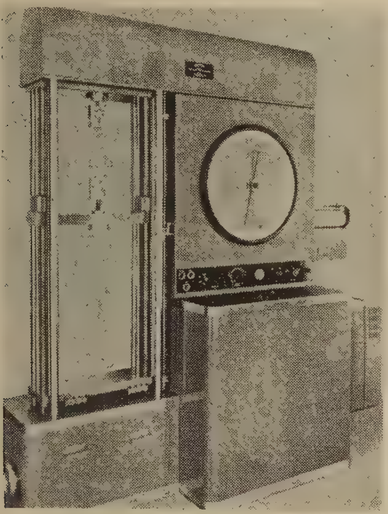
Material	Ultimate Strength, psi	
	Parent Metal	Weld
Aluminum 53ST	34,000 to 36,000	35,015
18-8 stainless steel, hot rolled	85,000 to 100,000	96,000
Carbon steel, SAE 1025	60,000	60,500

New Equipment . . .

New developments in precision testing machines, pipe and tube automatic cutoff machines, a pelleting press for processing powdered forms, tapping machines and various small tools and attachments are described herein. Hydraulic pumps, generators, tank compressors, magnetic pulleys, mill motor timers and buffing compounds are among the other items discussed.

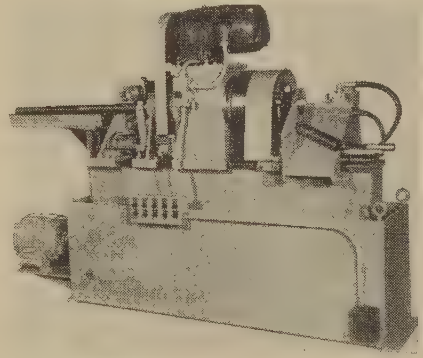
Precision Tensile Tester

DESIGNED primarily for precision testing of nonferrous metals, plastics, rubber, fibers and similar materials, a new type Baldwin-Tate-Emery testing machine has been announced by the *Baldwin Locomotive Works*, Philadelphia 42. Distinguishing features of the machine are its continuously-variable 400 to 1 positive speed range, great horizontal rigidity, elimination of backlash, and its accuracy. Its maximum capacity is 5000 lb. The machine uses a mechanical screw system; the loading crosshead is driven by two screws which pass through nuts in the crosshead. These screws are rotated by a 1 to 1 or 10 to 1 gear transmission which is driven by a variable-speed motor with General Electric Thymotrol control. Speed of loading is steplessly variable from 0.05 to 20 ipm and can be held constant within ± 2 pct, it is said. In the weighing system the Emery capsule, which is used in most Baldwin testing machines, is replaced by a 100 to 1 mechanical compound lever using flex plates. The specimen is pulled, compressed or flexed at the short lever end. The long end operates the force balance mechanism of the indicating system. Four ranges are provided: 5000 lb in 5-lb units; 0-1000 lb in 1-lb units; 0-200 lb in units of 0.2-lb; and 0-50 lb in units of 0.05 lb. Range change is by the conventional rotating mask.



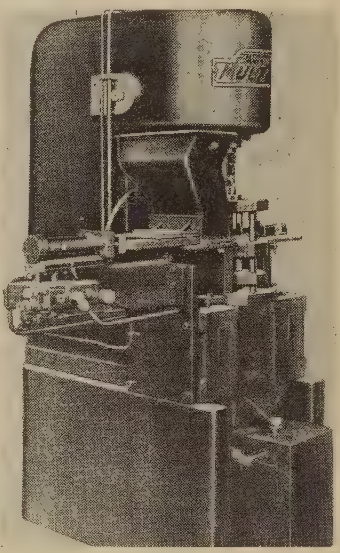
Automatic Cutoff Machines

HIGH production automatic machines for cutting pipe and tubing are announced by *Pines Engineering Co., Inc.*, Aurora, Ill. Work is fed by motor-driven rolls through a hollow spindle and against an adjustable receding target step. A rotating head automatically cuts the work to required length and produces a square face with end-to-end dimensions held to within a few thousandths of an inch. Production of 1500 pieces per hr is claimed, depending on composition of the stock, wall thickness and diameter. Complete machine cycle is said to be 1½ sec. Uncut stock may be manually placed on the feed rolls or a power driven conveyer with selector may be furnished to supply feed rolls.



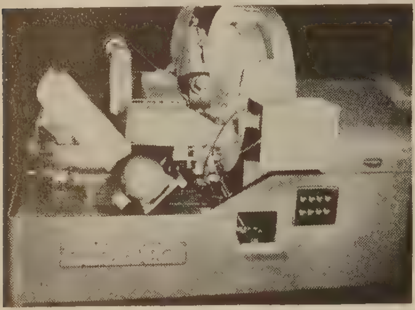
Pelleting Press

RECENTLY announced by *Denison Engineering Co.*, 1160 Dublin Rd., Columbus 16, Ohio, is an automatic pelleting multipress for the processing of powdered or granular forms of plastics or metals. Features of the press include independent control of charging, compacting and ejecting ram actions, easily tooled for rapid die changes, and quick die fill adjustment. The press is suitable for single or multiple cavity dies, solid or cored parts. All ram actions are fully automatic and completely interlocked regardless of individual regulations. The company's vibratory control principle is incorporated in both the die charging and the compacting rams.



Valve Seat Grinder

CALLED Consta-Contac grinding, a method of cylindrical grinding by which three or more parts are in constant contact with a single grinding wheel, is used in an automatic valve seat grinder developed by *Fitchburg Grinding Machine Corp.*, Falulah Rd., Fitchburg, Mass. This machine will grind automotive engine valve seats at the rate of 2160 per hr. Three valves are in contact with the wheel, sparking at all times. Both loading and unloading are automatic. The unique feature of the grinder is in the way the valves are fed to grind to size while they pass through a 90° sector of the wheel face. The arrangement of the machine comprises a vertical grinding wheel, belt-driven, and a vertical turret having 12 driving spindles to receive the valve stems. Spindles are powered by a 1 hp motor working through a friction drive. The turret is belt-driven by another 1 hp motor. The wheel rotates at 5000 surface fpm and the valves at 80 to 110 surface fpm.



Taper Attachment

A HEAVY duty taper attachment for lathes has been announced by the *Master Taper Co.*, 126 N. Clinton St., Chicago 6. It comes in sizes 34 and 40 in. between arms, for V or flat ways, and can be furnished for all lathes with a 13 to 26-in. swing. The attachment tapers up to 4 in. per ft, 20° max in either direction, 16-in. length at one setting. The swivel bar has V ways with the ends graduated one end in degrees and the other in inches per foot. The sliding fixture has a long bearing on the swivel bar with gibs to compensate for continuous usage.

Micrometer Stop

A MECHANICAL aid for speeding up the correction of stock lengths in screw machining has been marketed by *Keene Valley Engineering Co.*, Homer, N. Y. Known as the KVE micrometer stop, the accessory is described as eliminating conventional trial and error methods in making screw machine setup adjustments. A micrometer dial caps one end of the stop. The bolt on the other end of the stock stop can be turned to conform to any adjustment made by turning the dial. It is claimed an exact correction of a stock length can be made to 0.001 in. by adjusting the dial after running one piece. The micrometer stop is available in three shank diameters, ¾, ⅝ and 1 in.

Carbide Tool and Holder

CALLED 2-in-1 Econotools, carbide tipped tools and holders, announced by the *Econotool Co.*, Jenkintown, Pa., incorporate a flexible spring steel clamp arrangement which is said to allow stalling in cut with feed engaged without shattering the tip. The 2-in-1 hardened alloy steel holder has two clamping positions allowing easy reconditioning. The positive adjustment feature is said to be especally good for semiautomatics, etc. Tools are available in all manufacturers' standard grades of carbide and cast alloy.

Cemented Carbide Burrs

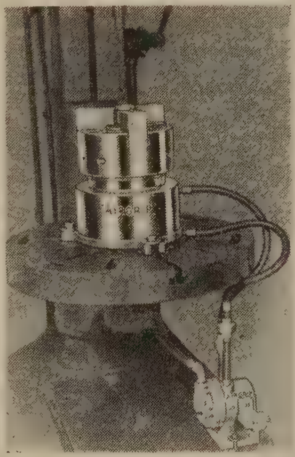
TWO new standard sets of Carburs have been added to the line produced by *Lincoln Park Industries, Inc.*, Lincoln Park 25, Mich. One set is comprised of seven different tools of ¼-in. head diam and with shanks ¼ in. in diam and 1¾ in. long. The other combines the seven ¼-in. diam tools with the standard set of 11 Midget Carburs which have ⅛-in. head diam and are 1⅛ in. overall with ⅛-in. diam shanks. Burrs are made of solid cemented carbide; shanks are not brazed to the heads. Carburs are said to cut any materials including hardened steel.

Tapping Machines

MODEL E tapping machines made in six sizes and employing interchangeable lead screw feeds have been announced by *Cleveland Tapping Machine Co.*, Hartville, Ohio. The machines are designed for single-hole tapping at high speeds and for use with multiple heads for tapping groups of holes. Adjustable heads may be used where the pattern of the hole varies in production; indexing tables, cross slides and hopper feeds may be combined with automatic cycling of the machine to provide automatic operation. The lead screw operates in a bronze lead-screw nut with 2 in. of full diameter thread contact to insure accuracy of thread form in class 3 and 4 fits. To eliminate tap breakage and increase tap life the machines have spindles mounted in roller bearings, and a sensitive clutch in combination with positive coolant control. Tapping depth is controlled to within 0.005 in. by a dial, making blind hole tapping accurate. Spindle speeds are changed by pulley belts. Automatic or manual control is available.

Drill Press Chuck

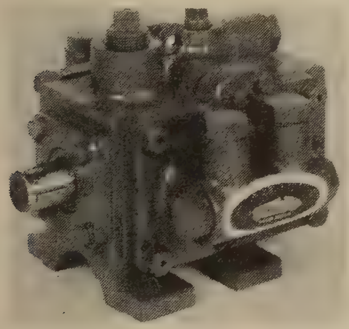
FOR use on assembly benches, milling machines and special tapping machines, a new type Airgrip drill press chuck and cylinder combination with foot control air valve has been introduced by *Anker-Holth Mfg. Co.*, 2723 Conner St., Port Huron, Mich. The unit consists of the standard Airgrip chuck mounted directly to a nonrotating cylinder, having a mount-



ing base suitable for drill press or similar tables. Chuck and cylinder combinations can be furnished with either solid or hollow centers, the open center permitting the workpiece when released to drop through the unit. Chucks have a double gripping action, air-grip locking and holding, either internally or externally.

Hydraulic Pump

ANNOUNCEMENT of a four-piston hydraulic pump which will operate in either direction of rotation, has been made by *Miller Hydraulic Engineering & Sales*, 3615 Hart St., Detroit 14. The pump weighs 30 lb. The four pistons are horizontally opposed. Hardened steel throws are keyed to the drive shaft. The forged bronze connecting rods have ball ends which take the pumping load on the inside of the piston dome. Relief valves are incorporated in the pump and are set at the factory to the desired pressure. At 1200 rpm the discharge pressure in psi ranges from 0 to 3000 and the gpm delivery is from 5.4 to 3.0. Discharge pressure is practically independent of drive speed, the manufacturer states. Horsepower input is said to be nominal.



Mill Motor Timers

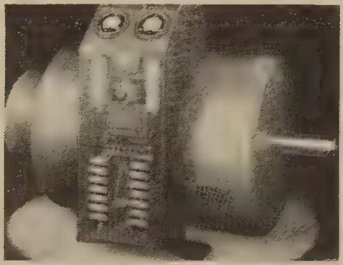
PNEUMATIC timers developed to provide a wide range of time limit acceleration unaffected by normal variations in ambient temperature and voltage conditions, have been announced by *Square D Co.*, Rivard St., Detroit. Danger of timing error as the result of friction between surfaces or moving parts and mechanical wear or foreign material on magnet surfaces is said to be eliminated. Air is transferred from lower chamber to upper chamber through a metering orifice. The air returns through a valve for instantaneous reset. The timers may be coupled to contactors or actuated by separate magnets. Pneumatic-time acceleration is said to permit motors to be brought to speed quickly, regardless of load conditions.

Turbo Blower

AN internal combustion engine powered unit designed primarily for emergencies caused by power failure has been added to the line of turbo blowers manufactured by *North American Manufacturing Co.*, Cleveland 7. For combustion systems using oil burners an oil pump may be had with the unit which is built in as an integral part. A governor on the engine maintains constant speed of the turbo blower and oil pump.

Generators

FEATURING a built-in automatic voltage regulating circuit, packaged generators announced by *Elecric Machinery Mfg. Co.*, Minneapolis 13, for use in engine-generator sets are compact, factory-assembled units, including revolving-field generator, direct-connected exciter, meters and selector switch for pre-setting voltage. The only external connections needed are leads to a generator switch. The voltage regulating circuit has no moving parts, is permanently connected and factory-adjusted to hold terminal voltage within 2 pct of the voltage selected, at any load or power factor within the generator rating. Sixty-cycle ratings at standard voltages and 0.8 power factor include 18.7, 25, 31.3 kva, 1200 rpm and 25, 31.3, 37.5 kva, 1800 rpm.

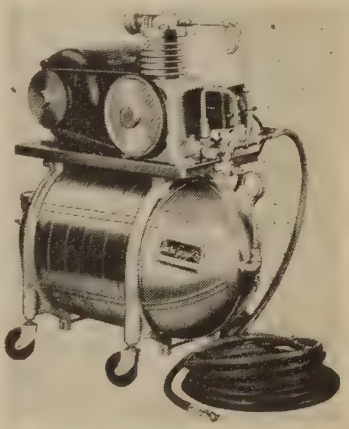


Electric Brake

THE ICB electric brake unit which utilizes in addition to ordinary friction, the power of electro-magnetic attraction between its ring-shaped electro-magnet and armature disk, is now available from *Warner Electric Brake Mfg. Co.*, Beloit, Wis. Clutch or brake action may be controlled manually or automatically, as machine operating cycles require. Rectified power is supplied from 110, 220 or 440 v ac current or a 6-12 v battery. The armature disk is designed to ride in constant light contact with the friction surface of the electro-magnet. The steel back plate of the armature disk acts as a blower to dissipate heat. Four sizes, 8½, 10¼, 12½ and 15½-in. diam are available. The shaft length occupied by the armature and magnet unit of these units is less than 2½ in.

Air Compressor

WHERE 120 to 150 lb of air is required, Model 3150 tank compressor has been designed by *Electric Sprayit Co.*, Sheboygan, Wis. A balanced ½ hp piston type compressor, cushion mounted on a 12-gal stainless steel tank and equipped with casters, pressure gage, outlet drain, safety valve, hose air chuck and an automatic starting and stopping switch maintains a constant air supply at between 120 to 150 lb, it is said. The unit is adapted to operate paint spraying equipment, dusting machines, blow torches, grease guns, etc.



Magnetic Pulley

KNOWN as the Perma-Pulley, a permanent magnetic pulley with Alnico poles developed by *Dings Magnetic Separator Co.*, Milwaukee, is available in 53 sizes ranging from 12 in. diam. x 12 in. width to 30 in. diam x 60 in. width. Designed for use as head pulleys in a belt conveyer system or in a selfcontained magnetic pulley type separator unit, these magnets are used to remove magnetic substances automatically from non-magnetic materials carried on the belt. The Perma-Pulley has a crown face to prevent belt weaving and to aid in even distribution of the burden across the belt as it passes over the pulley. A narrow gap design is used with non-magnetic gap plates between the poles and equal magnetic strength across the full width of the belt.

Buffing Compounds

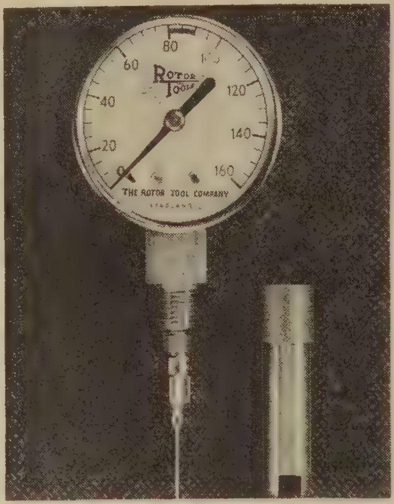
USE of Hydro-Buff 500 series of buffing compounds, announced by *Hydro Chemical Co.*, East Hartford, Conn., is claimed to cut cleaning time of pieces to 30-45 sec. The compounds are non-inflammable and are soluble in all proportions in the chlorinated hydrocarbons. Hydro-Buff is said to be especially suited for plants equipped for vapor-phase degreasing operations and is also readily removed in the water-phase cleaning cycle. The retention of the compound on buffing wheels is reported to be good; it cuts and colors in the same operation, eliminating the need for rouge. The film remaining on the piece, before cleaning, will protect against oxidation and staining for long periods of time, it is claimed.

Nickel Electrodes

FOR use in repairing cracked, broken, worn or defective castings and for correcting machining errors, Eureka No. 100 pure nickel welding electrodes have been developed by *Welding Equipment & Supply Co.*, 223 Leib St., Detroit 7. They can be used for repairing cast-structured drawing and forming dies, and are generally used as an intermediary material between the base metal and the final deposition of Eureka Drawalloy or tool steel electrodes. The electrodes, which operate on either dc or ac welding currents, are reported to produce a stable, smooth and spatter-free arc action with perfect slag coverage of weld deposits. They afford low temperature fusion with minimum penetration.

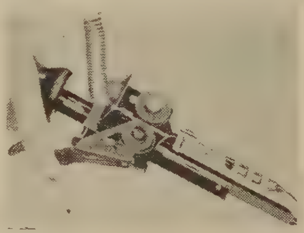
Needle-Type Pressure Gage

THE MSK-55, a needle-type pressure gage designed to show air pressure at the tool while the tool is operating, has been announced by the *Rotor Tool Co.*, Euclid Ave., Cleveland. A hollow hypodermic-type needle with a sharp tapered point is secured in an adapter which fits on a taper on the base of the air gage. The gage is inserted in the air hose, usually with the hose bent, to show pressure in the hose at the end of the tool while under full load. Because of restrictions in the air line, fittings or hose, this pressure may be different from that shown on the compressor, it is stated. When not in use, the needle is protected by a sleeve which has a slot in the end to facilitate removing the needle. The gage is fitted with a leather carrying case.



Soldering Attachment

JOBS involving soldering operations are said to be turned out faster and easier with the new Solder-Matic solder feeding attachment made by *Nelpin Mfg. Co.*, 45-17 Davis St., Long Island City 1, N. Y. This device, which feeds solder at the touch of the finger-tip, clamps on to any standard electric soldering iron. Solder in short lengths, in small coils, or fed from a spool as large as 25 lb, can be handled by the Solder-Matic, which takes solder from 1/16 to 3/16 in. in diam, and feeds up to 3/16 in. per stroke. Screw adjustment of the stainless steel nozzle guides solder exactly where needed, regardless of the size or shape of the soldering tip being used. Lightening holes in the unit cuts weight and assures cool operation.



Hard-Facings

A METHOD for hard-facing by using a metallizing gun and Metco-Weld H, a wire composed of a powdered hard-facing alloy extruded with a plastic binder, is announced by *Metallizing Engineering Co., Inc.*, Long Island City, N. Y. This Sprayweld method applies smooth, uniform, relatively thin hard coatings, it is reported. During the spraying operation, the plastic binder is completely volatilized, and the deposit consists entirely of the metallic constituent. Subsequent fusing, with any fusing torch, is said to result in a coating alloyed to the base and physically and chemically identical to hard-facings of the same alloy applied by other methods. The alloy used in Metco-Weld H possesses resistance to abrasion, resists corrosion and combines a low melting point with a long range of plasticity (1850° to 2050°F). It has high strength at red heat and resistance to oxidation.

Aluminum Industrial Wheels

MARKETED under the trade-name Airlite, aluminum wheels with either a molded on rubber tread or an all aluminum tread are available from *Aerol Co.*, 1823 E. Washington Blvd., Los Angeles 21. They are corrosive resistant and design features are said to permit easy, free rolling. Airlite wheels may be had with roller bearings, ball bearings, or bronze bushings, in 4, 5, 6, 8, 10 and 12-in. sizes with all standard axle sizes.

Curve Drawing Instrument

CALLED Infinarc, an instrument for drawing curves has been announced by *Cook Specialty Co.*, Green Lane, Pa. The desired curve is obtained with especially tempered wire forms whose shape is altered by moving either or both of two adjustment screws along slots. Infinarc is available with a 12-in. base and four preformed wire curves with which it is possible, it is said, to produce almost any shape desired, including reverse curves. The four wires are easily and quickly interchanged by snapping loops over the ends of the adjustment screws. It is made of stainless steel.

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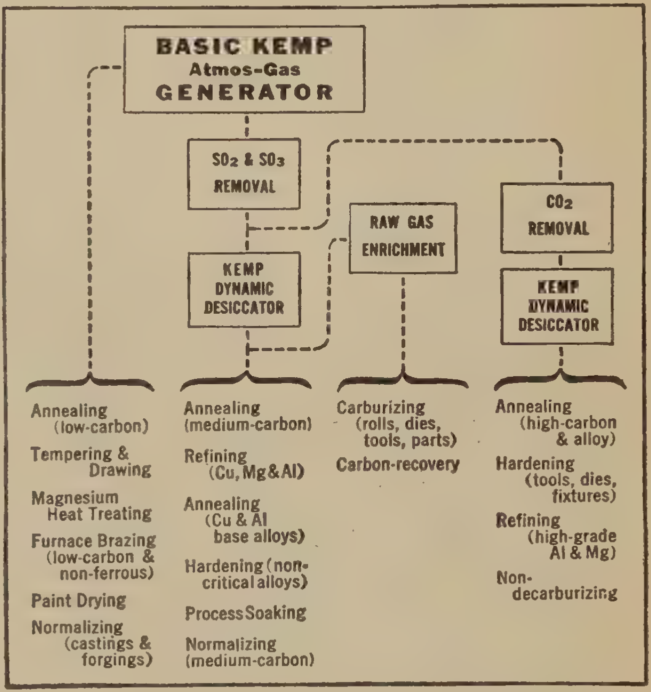
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Annealing (low-carbon)
Tempering & Drawing
Magnesium Heat Treating
Furnace Brazing (low-carbon & non-ferrous)
Paint Drying
Normalizing (castings & forgings)
Annealing (medium-carbon)
Refining (Cu, Mg & Al)
Annealing (Cu & Al base alloys)
Hardening (non-critical alloys)
Process Soaking
Normalizing (medium-carbon)
Carburizing (rolls, dies, tools, parts)
Carbon-recovery
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WALTER G. PATTON

• Auto output sags as steel cutbacks threaten future production schedules . . . Ford's top engineer discusses passenger car design for SAE members.

DETROIT—For the first time in the past 5 weeks automobile production fell below the 100,000 mark this week. Looking ahead at next week's output, approximately 20,000 Chrysler workers are facing layoffs of one week. Assemblies at Dodge and DeSoto have been brought to a halt although Chrysler Div. will continue to operate at an estimated 30 pct of normal. Plymouth has been shut down since Oct. 3. Assemblies of Dodge trucks are uneffected by the recent curtailment of Chrysler operations.

Meanwhile, Cadillac which is short of frames, will resume operations on Oct. 13 after a 2 week layoff. Briggs, which has been down 1 week, will remain closed again this week but is scheduled to reopen Oct. 20.

When the effect of recent plant shutdowns and possible cutbacks in steel later this year are taken into consideration, most sources agree that a 5 million-car year in 1947 is more of a hope than a possibility.

As usual the published reason for the plant shutdowns was lack of steel.

This week Hudson announced that production of its new postwar model will start Oct. 20. While detailed specifications of the new car are still a closely guarded secret it is known that the new model is completely redesigned and features a new type of body construction in which the passengers ride inside rather than on top of the frame. Described as a "step-down" model, the new Hudson is only 5 ft high and is reported to have the lowest center of gravity of any car in the industry. The latest design will definitely require more steel per car than the previous models.

The Hudson changeover program, although the most extensive in the company's history, will require only about a month. During the period of the plant shutdown about 9400 of Hudson's work force were laid off while the remaining 7500 workers were retrained to assist in the extensive revisions to the plant. In addition to extensive retooling, Hudson engineers have had to teach its workers the new technique that is required to assemble a car having the new type of frame construction.

Most sources here believe that Hudson's quick changeover will be duplicated at least in part by other manufacturers. Auto producers learned a great deal about plant changeovers during the war period; also they have had plenty of time to prepare for the present changeover. In the case of most manufacturers the introduction date for new models has been set back at least half a dozen times.

Hudson's new six-cylinder engine will develop more than 120 hp. At the present time, the highest rated capacity of any six-cylinder engine is 114 hp.

MEMBERS of the Detroit section of SAE who heard a review of passenger car history by Harold Youngren, vice-president and director of engineering and research of Ford Motor Co., learned this week there is little about the modern motor car that is really new.

The Brush car built in Detroit 37 years ago had coil springs all around, Mr. Youngren said. During the past 50 years, Mr. Youngren pointed out, the automobile industry has seen almost every kind of spring suspension on various American passenger cars except the torsion bar which is now being used on trucks. Yet it was not until 1934 that several American manufacturers adopted the principle of independent wheel suspension.

The 1909 Carter had an infinitely variable transmission. The 1903 Orient Buckboard featured an integral frame and body. The 1888 Benz had an engine in the rear. Scripps-Booth produced a light car in 1903. Maxwell-Briscoe produced steel bodies in 1903. The column-mounted gear shift lever was used by Benz in 1888 and by Pierce-Arrow in 1904.

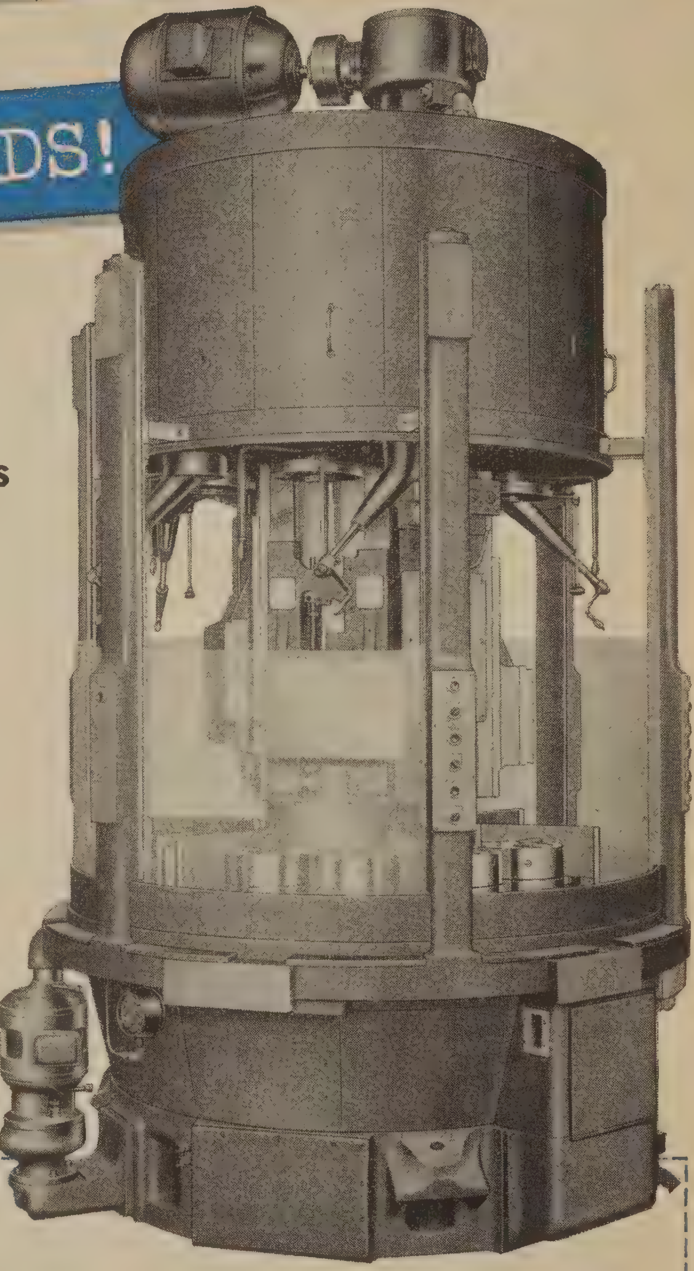
Mr. Youngren attributed the long delay in introducing many of the engineering features of American automobiles to the fact that such things are adopted only when there is a real need for them. What the car owner needs—not what he wants—is the most important factor in determining passenger car design, Mr. Youngren told his audience.

In view of the present interest in aluminum, it was of considerable interest to the audience to learn that Pierce Arrow and the Aluminum Corp. of America produced an all-aluminum car back in 1923. This car was 85 pct aluminum by weight, Mr. Youngren said. Although it had a 133-in. wheelbase, the car weighed only 3045 lb compared with 3730 lb for the stock model. This particular car had aluminum cylinder heads, aluminum cylinder blocks, crankcase with cast iron sleeves and an aluminum oil pan. Pistons, connecting rods and chain case cover were aluminum. The frame was pressed sheet aluminum. Front axle, steering arms, brake levers, wheels (including drum and hub) were made of forged aluminum. So were the rear axle, the torque tube and even the body doors and radiator.

Moreover, Mr. Youngren added,

OUT TO BREAK SPEED PLUS ECONOMY RECORDS!

The New BULLARD Type "K" Mult-Au-Matics Set the Pace For Small and Medium Size Jobs



Designed primarily for small and medium-sized jobs of aluminum, magnesium and other alloys, the new BULLARD Type "K" Mult-Au-Matic brings greatly increased speed and new economies to such types of work. New features include:

1. Higher Spindle Speeds—41 speed changes, 82 rates of feed, selective feeds and common speeds at all stations. And spindle speeds have been increased up to 900 rpm . . . *three times the speed ever before available*.

2. Less Time For Index Cycle—Chucks are automatically opened at the loading station, and closed by a foot treadle. Operator's hands are free for proper chucking, and the carrier automatically indexes when the last operating head returns to "neutral"

3. Twin Spindle Applications—Offering to small jobs a choice of advantages — two pieces for every machine index cycle, or double the production. (Single spindles available if required.)

4. Spindle Gear Synchronizing—Gear life is greatly increased by the incorporation of spindle gear synchronizers.

In design, construction and performance, the new Type "K" Mult-Au-Matic offers many advantages worth investigating for your own production . . . Write for details. THE BULLARD CO., Bridgeport 2, Conn.

The BULLARD Type "K" Mult-Au-Matics for work up to 10" in diameter, are available in four models; 6 or 12 spindles with spindle speeds at 100 to 900 rpm, and 8 or 16 spindles with spindle speeds at 98 to 883 rpm.

BULLARD

BULLARD CREATES ***NEW METHODS*** TO MAKE MACHINES DO MORE ten of these aluminum cars were built and several were driven up to 100,000 miles without presenting any serious operating problems.

IN Mr. Youngren's opinion, the obstacles to aluminum cars in the past has been the fact that the public needed low cost cars rather than light cars. Cost is still a major stumbling block, he said, but the present steel shortage, coupled with the necessity to maintain production has prompted Ford and other manufacturers to explore every possible way to use aluminum on present production models.

Mr. Youngren also pointed out that four-wheel brakes are at least 25 or 30 years old. Employed first on European racing cars, four-wheel brakes were available 10 years before they were actually adopted by American manufacturers, he said. Again, Mr. Youngren emphasized, it was the need for brakes to stop vehicles traveling at relatively high speeds that eventually forced adoption of four-wheel brakes. "When the need for four-wheel brakes arose," he said, "they were adopted by all manufacturers."

According to Mr. Youngren, the same kind of experience brought all-metal bodies to the auto industry. The know-how languished many years, he told his audience, before a public need supplied the impetus necessary to change over from wood to metal construction.

Looking briefly into the future, Mr. Youngren predicted that the fact that cars are designed today to carry both people and things—not just people—will have an important influence on future passenger car design. More and more, he said, the passenger car is becoming a "room on wheels." In his opinion, this spells wider, roomier cars with ample luggage space.

WITH cars operating at high speed on the highway, Mr. Youngren said, smooth, flowing lines are a "must." Mr. Youngren also believes that the V-8 engine and the horizontal opposed-type or pancake engine will become increasingly popular because of compactness, ease of accessibility, and simplicity of design.

Although he did not say so, it was evident that Mr. Youngren feels that engine economy will play an increasingly important part in passenger car design. The speaker questioned the ability of this country to consume 31 billion gal of gasoline a year at present and meet possibly greater demands in the future.

The front-wheel drive offers some interesting possibilities including low overall height, reduced weight and racy appearance, according to the Ford top engineer. As recently as 1936, Mr. Youngren told his listeners, an estimated 23 pct of all European vehicles were front-wheel drive.

Mr. Youngren also foresees possibilities for power steering of luxury passenger cars. Although he said little about automatic transmissions, the very fact that he rates as an expert on automatic transmissions and is directing Ford's transmission program simply made this subject too hot to talk about.

"We must produce cars having a better ride, more comfortable seats, better vision, and ventilation, particularly in bad driving," Mr. Youngren concluded.

Tucked away neatly in Mr. Youngren's talk is undoubtedly a surprisingly accurate description of the new 1948 Ford. But no one attending the meeting was willing to claim ability to decode Mr. Youngren's talk into the new Ford car even though the basic principles of Ford engineering are undoubtedly clearly stated.

PICTURES OF PROGRESS: *One of General Electric Company's long-pending expansions in the West nears reality as John Hood, western plants manager; Claude A. Schutter, resident engineer from Schenectady; and Charles E. Wilson, president; study blueprints of the new motor plant at the 57-acre site near San Jose, Calif.*

GM September Output Up Despite Some Shutdowns

Detroit

• • • **Despite shutdowns** for short periods in several Chevrolet and Fisher Body plants and in the final assembly line of Cadillac, September output for the General Motors Corp. plants in the United States and Canada totaled 167,608 units compared with 143,828 units in August.

Highest production attained this year in any one month was 175,262 reported during April.

In the first 9 months of 1947, General Motors produced 1,372,659 vehicles in the United States and Canada. Comparable figures for 9 months through September 1940 are 1,402,274 and for the first 9 months of 1941, 1,865,410.

Total assemblies of GM passenger car divisions during the first 9 months of this year are as follows: Chevrolet, 504,651; Buick, 197,106; Pontiac, 160,462; Oldsmobile, 141,563; Cadillac, 42,234.

Chevrolet truck production was 223,599. GM Truck & Coach built 40,855 trucks and 3840 coaches. Canadian plants of General Motors assembled 58,349 vehicles during the 9 month period.

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Washington . .

EUGENE J. HARDY

• Steel allocation not likely under Marshall Plan . . . Present controls seem sufficient . . . White House dodges expansion issue . . . Bureau of Mines pushing development of new mineral sources.

WASHINGTON — Allocation of steel output—a step advocated by a small group of government officials concerned with execution of the Marshall Plan—probably won't come about, THE IRON AGE learned this week.

While the White House and Capitol Hill exchange high-sounding phrases over Europe's plight and shout sweet nothings as to the need—or lack of need—for calling a special session, a hard core of agency heads is working overtime to get an airtight case ready for U. S. participation in Europe's rehabilitation agenda.

Commerce Secretary Harriman is the key figure in the little group which has set Nov. 1 as its goal for final drafting of a U. S. aid program. Taking a lesson from the bad press thus far received by Charles Luckman, chairman of President Truman's Citizens Food Committee, Mr. Harriman has instructed his planners to avoid public statements until a complete blueprint has been dispatched to the White House and released by Mr. Truman.

However, one of Mr. Harriman's top officials told THE IRON AGE that a return to allocation of steel output "is not very probable." Although changing conditions in Europe "may alter" the requirements as laid down in the Paris recommendations, the administration believes that existing controls will be sufficient to execute the Marshall Plan as presently understood.

* * *

THE White House will not involve itself in the steel capacity expansion issue, if the latest report of President Truman's Council of Economic Advisers is a reliable barometer in this respect.

In a brief—12 page—interim report to Mr. Truman recently, Dr. Edwin G. Nourse, council chairman, stated that there is "considerable difference of opinion" as to what the steel industry's rate of expansion should be. Dr. Nourse and Leon H. Keyserling and John D. Clark — the council's other two members — pointed out arguments advanced by both expansion advocates and dissenters.

Particular mention was made of the fact that any large scale expansion at this time would require the diversion of considerable quantities of steel for plant expansion. Dr. Nourse told THE IRON AGE that the council feels if industry "stops now to expand, we will have still more shortages." The council fully recognizes, he added, the existence of such industry cycles as the "shortage of steel due to coal shortages which are due to car shortages which are due to steel shortages which again are caused by scrap shortages, and so forth."

The council currently is preparing for President Truman a report on the financial and fiscal aspects of U. S. aid to Europe under the Marshall Plan. The council's report, together with those of Secretary Harriman, who is studying availability of U. S. goods in the light of the Marshall Plan, and Secretary Krug, who is coordinating activity among government agencies involved in the Marshall Plan, will be forwarded to Mr. Truman by Nov. 1.

The interim economic report already made to Mr. Truman has not been made public. It probably will not be submitted to Congress, according to presidential aides. Dr. Nourse described it as "a foreshadowing of recommendations" to be made in the council's annual report to the President and Congress. The annual report is due early in January.

* * *

WHILE the known domestic copper reserves in the United States are sufficient to last another quarter-century, production in recent years has been so much in excess of discovery and development of new fields that the Bureau of Mines is stepping up its efforts to explore and promote commercial development of new mineral sources.

Available known reserves of ore in the United States have been estimated to contain about 20 million tons of recoverable copper. This, in turn, is estimated to be sufficient for 25 years at the present rate of production or less than 20 years at the current consumption rate. Although the production has since dropped considerably, the peak year of 1943 saw more than a million tons of metallic copper smelted from domestic ores.

Tangible results of the Bureau's work are to be seen in the scheduled commercial development of the new San Manuel field in Pinal County, some 45 miles northeast of Tucson. The San Manuel Copper Corp., a subsidiary of the Magma Copper Co., has planned wide-scale mining operations through which at least 425 million tons of ore are expected to be mined at the ultimate rate of 25,000 tons daily.

WITH recently announced plans by Anaconda to mine some 130 million tons of 1 pct ore near Butte, Mont., together the two projects are expected to add another 3 years to the life of known American reserves. While this planned new production will not materially change the status of copper as a strategic and critical material, it does illustrate the efforts of the Bureau to find and promote new mineral resources.

Since 1940, the Bureau has in-

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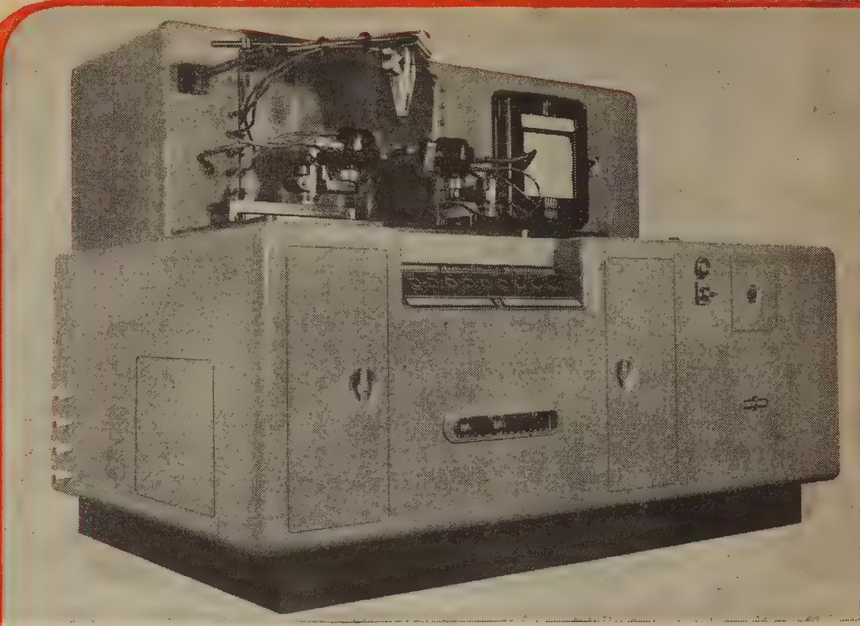

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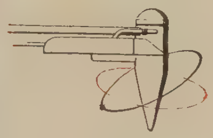

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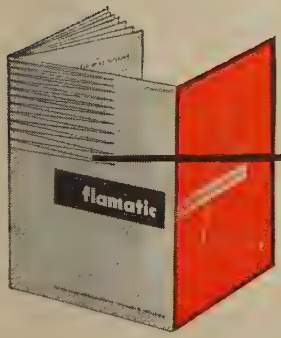

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IC IN OPERATION AT THE METALS SHOW, CHICAGO AMPHITHEATRE, OCTOBER 18-24: BOOTH 2702 vestigated at least 46 copper deposits located in 13 states and Alaska. Projects have been completed in Nevada, Wyoming, California, Idaho, Arizona, North Carolina, Vermont, New Mexico, Colorado, Montana, Virginia, Utah, Wisconsin, and Alaska.

As a direct result, more than 39 million tons of ore having 0.88 pct copper content and 2.2 million tons of 2.55 pct copper ore have been added to the nation's reserves. The Bureau says it is currently conducting investigations of copper fields in Nevada, Pennsylvania, Arizona, Georgia, and Virginia.

The San Manuel deposit was first located as long ago as 1870, but little was done about exploration or development until 1916, at which time three churn-drill holes were sunk. Work then ceased and was not resumed until 1943 when the Bureau began an investigation which resulted in the greatest wartime copper discovery.

PRELIMINARY mapping and sampling began in March 1943 and drilling was started in November and completed by February 1945. Drilling by the Bureau indicated existence of 30 million tons of ore; subsequent drilling by commercial interests increased the estimate by 14 times.

Also, initial drilling indicated that there was an underlying block of ore about 3100 ft long, up to 800 ft wide, and ranging from 500 to 900 ft in depth. Subsequent work has indicated that the size of the block is considerably larger than the original estimate.

Sufficient promise to pay rock had been shown by autumn of 1944 that Magma Copper Co., took options and organized a subsidiary —the San Manuel Copper Corp. Private drilling resulted in the revised estimate of 425 million tons of ore. According to the Bureau of Mines, with an 80 pct recovery from ore containing 0.8 pct copper, a tonnage of 2,720,000 tons of pure metallic copper can reasonably be expected.

Federal Court Rules Against Restraints In Railroad Springs

Washington

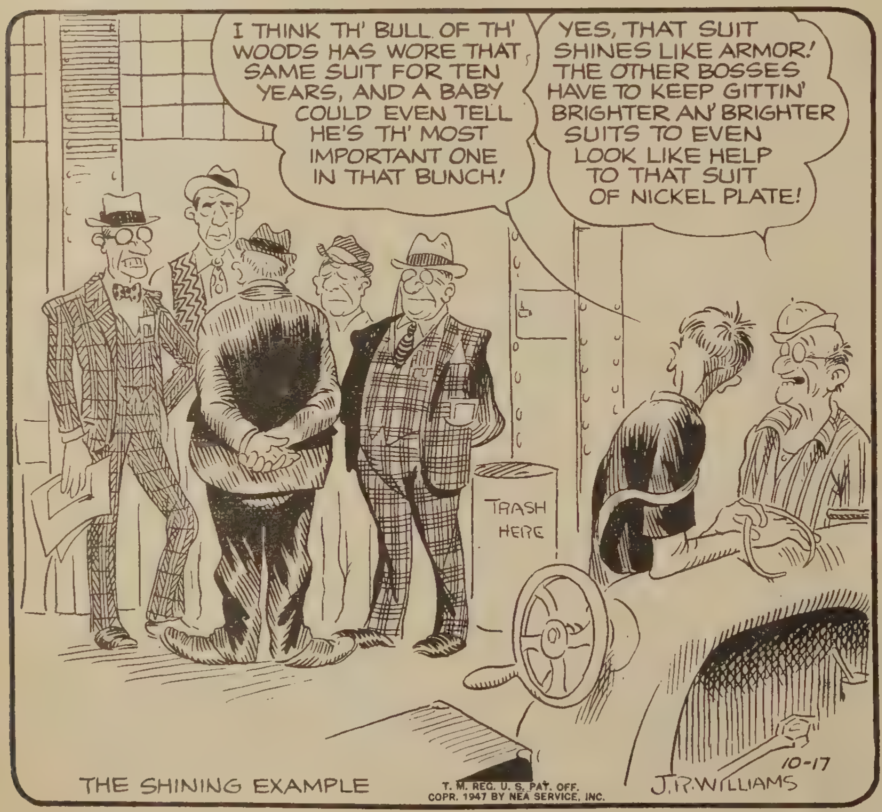
• • • **A final judgment,** eliminating restraints in the manufacture and sale of railway springs and spring plates, has been entered against nine defendant manufacturers and associations, the Antitrust Division of the Justice Dept. reports.

The two-year-old suit was terminated in the federal district court at Hammond, Ind., on October 4. Concerns named in the consent judgment are American Locomotive Co., American Steel Foundries, Baldwin Locomotive Works, Crucible Steel Co. of America, Pittsburgh Spring & Steel Co., Union Spring & Manufacturing Co., Universal Railway Devices Co., Pittsburgh Steel Foundry Corp., and Railway & Industrial Spring Assn.

The judgment prohibits the defendants from fixing prices or other terms of sale or resale of springs and plates, from fixing sales quotas or allocating orders, or from agreeing among themselves to stay out of the production of specific types of springs and plates. It also ends various collusive practices followed in submitting bids for sale of the products. The Railway & Industrial Spring Association agrees to confine itself to performance of research and experimental work and to the compilation and distribution of general trade information.

A separate consent judgment was entered into against the Symington-Gould Corp. on April 1, 1947.

THE BULL OF THE WOODS BY J. R. WILLIAMS


I THINK TH' BULL OF TH' WOODS HAS WORE THAT SAME SUIT FOR TEN YEARS, AND A BABY COULD EVEN TELL HE'S TH' MOST IMPORTANT ONE IN THAT BUNCH!
YES, THAT SUIT SHINES LIKE ARMOR! THE OTHER BOSSES HAVE TO KEEP GITTIN' BRIGHTER AN' BRIGHTER SUITS TO EVEN LOOK LIKE HELP TO THAT SUIT OF NICKEL PLATE!
TRASH HERE
THE SHINING EXAMPLE
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COPR. 1947 BY NEA SERVICE, INC.
10-17
J.R.WILLIAMS

Buys Wire Finishing Plant

Washington

• • • **Allegheny Ludlum** Steel Corp. has purchased the surplus wire finishing plant located at Dunkirk, N. Y., for $1.5 million. Previous offers of $1¼ million for the $4¼ million plant had been rejected by WAA.

Company officials told the disposal agency that it was planned to spend a half-million for conversion and improvement of the facilities. Production is scheduled to start within 60-90 days after all stainless steel wire facilities now located in the firm's other Dunkirk plant are removed to the newly acquired government plant.

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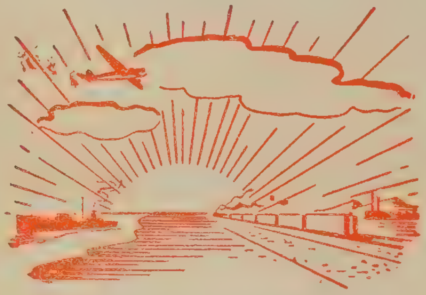
West Coast

ROBERT T. REINHARDT

• Cost of maintaining aircraft production facilities for emergencies soars . . . Coal car shortage controls Geneva production . . . Problems ahead in commercial use of jet propelled planes.



SEATTLE—Cost of preparing the aircraft industry for an emergency is soaring about as high as some of the new stratoplanes now being produced, if the report of William M. Allen, president of Boeing Aircraft Co. is accepted at face value.

In his statement before the Air Policy Commission, Mr. Allen said that the absolute minimum annual backlog of a heavy bomber plant must be $80 million and that such a plant should maintain at least 13,000 employees. This type of operation is essential, according to Mr. Allen, if a heavy bomber plant is to be kept at a level of production which would enable rapid expansion in a time of emergency without unreasonable delay and unreasonable high cost.

Pointing out how costs have risen as science has improved and increased the efficiency of airplanes, the Boeing president said that the first B-17 Flying Fortress cost $660,000 to develop, the first B-29's cost $8,850,000 and that the company's new XB-47 jet bomber cost $10,500,000. He made no report on the cost of the XB-52 heavy bomber being developed at the Seattle plant. This new unit is being built secretly and is now in the preliminary stages.

The Boeing Aircraft Co. insists that a minimum of five B-50's must be turned out each month if anything like a reasonable cost and a balanced organization, capable of expanding in an emergency, is to be maintained. Boeing is expected to spend $14 million this year on experimental work which includes improvements in the B-50, and the B-50-C. The former ship weighs 165,000 lb, has a maximum bomb load of 20,000 lb, and a maximum fuel capacity of 10,000 gal.

To meet present production schedules on stratocruisers, stratofreighters and bombers, Boeing is making a strenuous effort to hire at least 2000 more employees.

It is possible that Boeing's heavy demands on the labor market at this time is contributing to the prolongation of the 14-week-old strike of auto mechanics here.

THE Seattle Automobile Dealers Assn. has offered a flat $1.65 per hr, which has been turned down by International Assn. of Machinists, Local 289, in spite of the fact that this figure was that originally proposed by union leaders. Other workers in the garages of Seattle, such as sheet metal men, painters, demonstrators and greasers, are not respecting the mechanics' picket lines.

One odd twist has developed in the strike strategy of the union, according to inside reports. Some of the wives of strikers apparently are becoming a little perturbed because of the absence of the weekly pay check and instead of swamping the telephone switchboards of auto dealers as a nuisance measure as was suggested by some of the strike leaders, they are instead jamming the switchboards of union headquarters with calls asking just when the strike is going to end.

Many of the wives have figured out that the strike for an extra 25¢ an hr has already cost their breadwinner about $800 unless he has been fortunate enough to find work elsewhere to tide him through. It is also known that some of the more fortunate men on strike who have secured employment during the layoff period have been called from their jobs to do picket duty.

At least 1000 new jobs were made available during July and August through the opening up of 30 plants and expansions of 61 industrial companies. New plants represented an investment of approximately $800,000 and the expansion program of the older companies involved approximately $6 million.

SALT LAKE CITY—Utah coal production is limping along at about 60 pct of normal because of a shortage of railroad cars to move the coal away from the mines. The Denver & Rio Grande Western, the major coal carrier, is loading about 200 cars per day compared to a maximum of about 450 during the war, and the supply is being currently shortened by diversions to the sugar beet haul.

Geneva Steel Co. would be in a desperate plight had not Walther Mathesius, president, foresightedly wangled 300 over-age ore cars from corporation subsidiaries several months ago. As it is, Geneva's production rate is being controlled by its coal supply.

Generally the mines are working 4 days a week and some are down to three. None has closed entirely.

The D. & R. G. W. has not received a single one of 500 new cars ordered a year and a half ago. Union Pacific has received 370 of 1000 cars on order.

During the war the car situation was relatively easy in this area because of the tremendous flow of loaded cars to West Coast ports and the movement of empties eastward

The U. S. Bureau of Mines has proposed that Geneva Steel Co. and Kaiser Co., Inc., put up $125,000 each to finance an exploration program for new coking coal deposits in Utah's Carbon County. The work would be done under the supervision of the U. S. Bureau of Mines and Geological survey. The plan was prompted by the fact that the known supply of cokable coal is limited and that additional supplies must be developed if the West's new basic steel industry is to enjoy permanency.

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LOS ANGELES—Commercial use of jet transport planes is not possible until problems of all-weather, all-plane traffic control are solved adequately. This prerequisite to jet transport development was pointed out by Warren T. Dickinson, assistant to the chief engineer, Douglas Aircraft Co.

He said that inherent characteristics of jet propelled aircraft require their operation at altitudes and speeds considerably greater than the present four-engine transports.

"Jet transports must not only fly high, they must also be dispatched to cruise at their most favorable altitude because any deviation from this height affects the payload, and hence the revenue, so quickly and forcibly," Mr. Dickinson went on. "Thus the situation arises where the jet airplane will have to dictate to the air traffic controller at what altitudes or what air path it will fly to any given destination rather than vice-versa."

As much as 30 pct of the tooling cost of a typical transport airplane, as affected by design, is within the control of the designer, according to G. W. Papen, production design engineer, Lockheed Aircraft Corp. Care in selecting structural breakdown, type of joints, and design of details, are requirements for good tooling, and are all directly tied up with the design of the parts and assemblies.

"Uneconomical breakdown and joint or structural design may cost thousands of needless tooling dollars. Uneconomical design of one detailed part or small assembly may not run into thousands of dollars but uneconomical design of thousands of details and small assemblies will run into thousands of needless tooling dollars," Mr. Papen stated.

The total effect of design on manufacturing cost depends on the efficiency of the plant and the quality of the engineering and may be as much as 30 to 35 pct of the total cost of an airplane. A reduction of this percentage may be achieved by better engineering, better design, and by closer attention to design influence on cost, he went on.

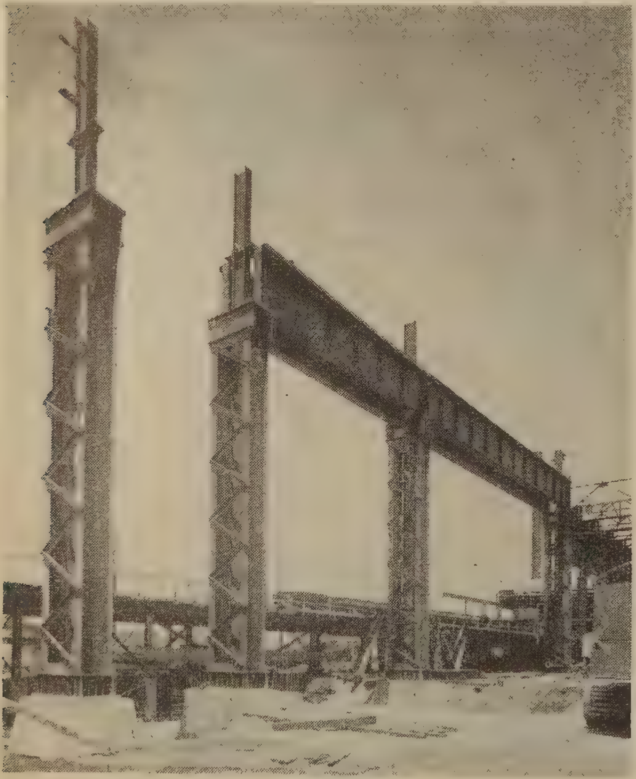
* * *

CAPITAL investment in new or expanded industries in the Los Angeles area increased from $70,888,000 to $103,736,500 for the first 9 months of the year—more than $30 million being placed in industry during September.

Last month's industrial expansion exceeded that of any other month this year for $10 million, the total hitting $32,848,500, of which $31,230,000 is going into new plants and $1,618,500 into 34 existing plants.

So far this year 169 new factories and other structures scheduled for Los Angeles County total more than $64 million in value, while 303 expansion projects in the past 9 months are estimated at over 36½ million.

New enterprises are expected to create 6712 jobs, while broadened activities of other firms will make 10,362 jobs.



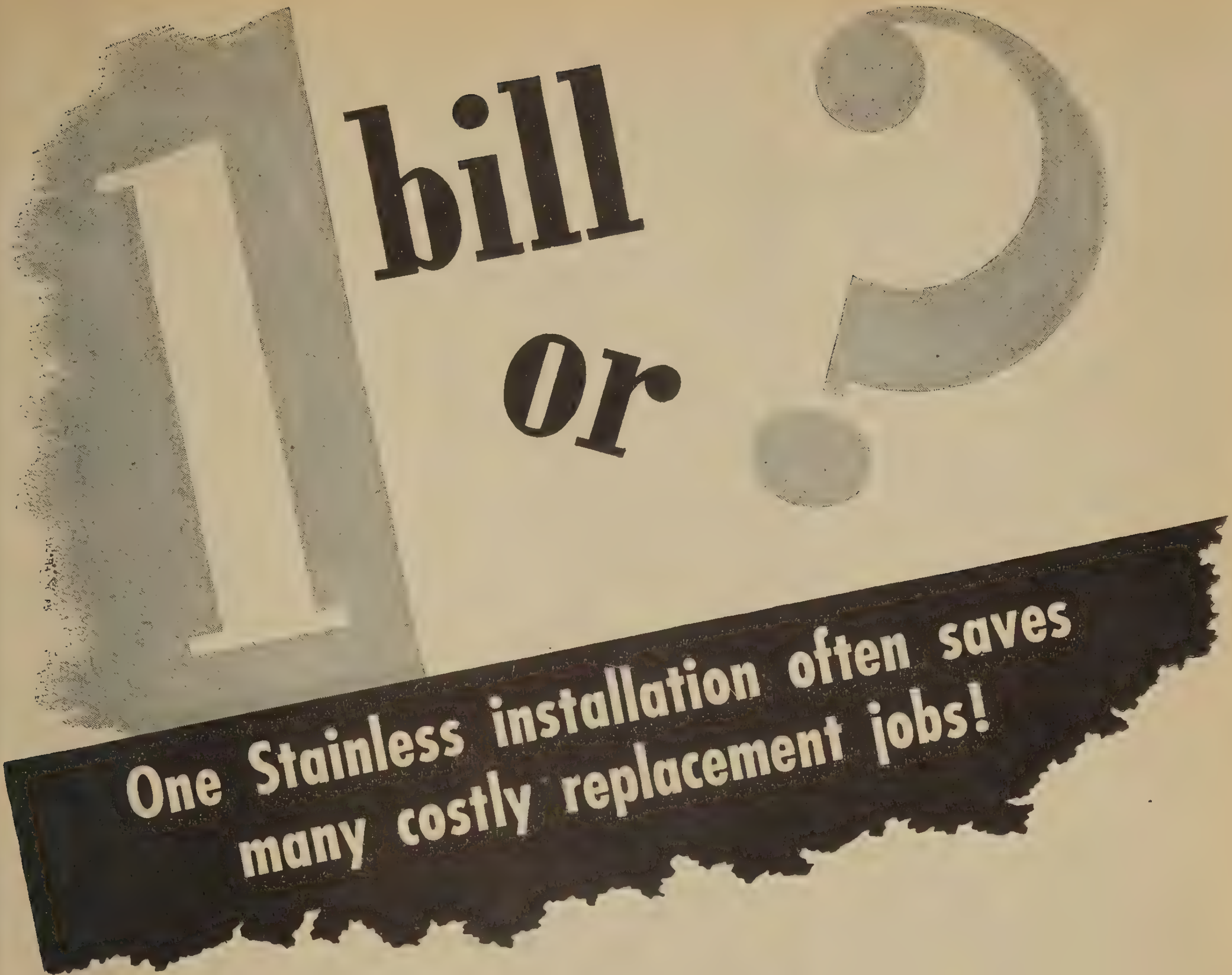
ONE HAND WASHES THE OTHER: *Bethlehem-Pacific Coast Steel Corp., Alameda Fabricating Works, made up these 80-ft. long crane girders being erected at Los Angeles as a part of the company's new building which will house the West Coast's largest electric furnace. The girder is more than 7 ft. in height, weighs 35,000 tons and will support ladles of molten steel which may eventually return to Alameda for fabricating.*

U. S. Steel Export Co. Announces New Carbon Steel Price Schedule

New York

• • • **Upward revisions** in export prices of carbon steel products have been announced here. U. S. Steel Export Co. has issued a new schedule of prices, effective Oct. 13, to take account of the domestic price revisions. These are prices, subject to adjustment for price at time of shipment, f.o.b. mill, with freight included to New York, Philadelphia or Baltimore. Prices, per 100 lb unless otherwise noted, are as follows:

Blooms, Billets and Slabs	
Rerolling, per gross ton	$55.93
Forging, per gross ton	65.93
Structural Shapes	3.36
Sheet Piling	3.86
Plates	3.61
Floor Plates	4.86
Skelp	3.16
Hot-Rolled Bars	3.61
Concrete Rein. Bars	3.46
Hot-Rolled Sheets	
18 Ga. and heavier only	3.54
Galvanized Sheets	
Plain, 10 Ga.	4.41
Corrugated, 10 Ga.	4.51
Cold-Rolled Sheets, 15 Ga.	4.24
Hot-Rolled Strip	3.36
Rails—Standard No. 1, per net ton	68.47
Rails—Light, per net ton	72.82
Joint Bars for Std. Rails	4.23
Tie Plates	4.23
Tin Plate—American Coke 107, base box	6.91
Wire Rods	73.18
Cold-Rolled Strip:	
.25 Carbon and under	4.11
Bright Nail Wire	4.11
Black Annealed Wire	4.76
Galvanized Plain Wire	5.21
Barbed Wire—Lyman, 4 pt.-5 in., 80 rod spool	5.00
Barbed Wire—Glidden, 2 pt.-4 in., 80 rod spool	4.59
Nails—Bright	4.83
Staples—Bright	5.63
Staples—Galvanized	6.58
	Discount Pct
American Standard Pipe T & C:	
2½ & 3 in. Black, buttweld	52.4
2½ & 3 in. Galvanized, buttwell	37.9
3½ to 6 in. Black, seamless	47.4
3½ to 6 in. Galvanized, seamless	32.4
English Gas Tubes T & C:	
2½ & 3in. Block, buttweld	51½
2½ & 3 in. Galvanized, buttweld	40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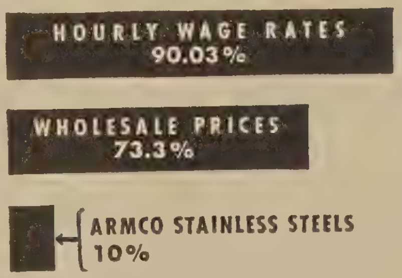
If you are using short-lived materials that last only a few months or years, think how many costly future installation and maintenance bills you can save by switching to ARMCO Stainless. In many applications this rustless metal will last indefinitely.

Stainless costs less in the long run because it eliminates budget-draining manpower costs that represent a big part of every replacement job. According to Bureau of Labor Statistics these costs (hourly wage rates) *went up* 90.03%, and the wholesale price index of all materials increased 73.3% from 1937 to April, 1947.

INCREASES (1937-1947)



Yet the average price of ARMCO Stainless Steel increased only 10% during that time.

Plan now to use ARMCO Stainless for equipment, maintenance and repair work, and consumer products as well. Besides saving you money it gives you many other advantages: excellent resistance to heat and corrosion, great strength, attractive appearance, and decided sales appeal.

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ARMCO Stainless Steel sheets, strip, plates, bars and wire are available now for quick deliveries. Call our nearest district office or Armco Distributor, or write The American Rolling Mill Company, 388 Curtis Street, Middletown, Ohio.

* * *

Help keep steel flowing from the mills by turning in your scrap. The need is critical—the shortage greater than during the war.

ARMCO

ARMCO STAINLESS STEELS

• **J. G. Phillips,** vice-president and treasurer of International Business Machines Corp., New York, has been elected executive vice-president. **Thomas J. Watson, Jr.,** vice-president and a director of the corporation, has been elected to the executive and finance committee; **A. L. Williams,** controller, has been named treasurer; **Herbert T. Hansford,** assistant controller, succeeds to the post of controller, and **Bernard Wiegard,** IBM general auditor, becomes assistant controller.

• **C. Foster Harry** has been appointed vice-president in charge of manufacturing of the Universal Winding Co., Providence. Mr. Harry was formerly engineering field supervisor with Rath & Strong, Inc., Boston.

• **Alfred E. Barton** has been elected vice-president and treasurer of Graham-Paige Motors Corp., Detroit. For the past 5 years Mr. Barton has been associated with Willys-Overland Motors as assistant treasurer.

• **Harry M. Reed** has been elected to the position of secretary of the board of directors of Vanadium-Alloys Steel Co., Latrobe, Pa. Connected with Vanadium-Alloys since 1925, Mr. Reed had served since 1927 as assistant treasurer of the company's cold drawn products subsidiary, Anchor Drawn Steel Co.

• **George E. Hallenbeck,** president since 1939 of Baker Bros., Inc., Toledo, has been elevated to the position of chairman of the board. **A. L. Baker,** vice-president and general manager, has been elected president and general manager. **Herbert L. Tigges,** vice-president in charge of sales, has been elected executive vice-president; **M. E. Fischer,** superintendent, elected vice-president in charge of manufacturing; and **Thomas L. Hallenbeck,** research engineer, elected vice-president and director of engineering.

• **Benjamin E. Sivyer,** former divisional sales manager for Chain Belt Co. at Milwaukee, has been appointed Wisconsin sales manager. He has been with Chain Belt 15 years, including 5 years as district sales manager in San Francisco.

PERSONALS

○ ○ ○

• **Roy C. Hobson** has been elected assistant to the vice-president in charge of sales, National Malleable & Steel Castings Co., Cleveland. Mr. Hobson has been assistant sales manager of the company's Chicago works since 1945. He started with National Malleable & Steel Castings Co. in 1928.

• **C. S. Lawson,** vice-president of Sloss-Sheffield Steel & Iron Co., Birmingham, has been elected a director of the company. He was elected to fill a vacancy created by the resignation of **Henry Parsons,** a member of the board since 1908.

• **F. William Kahrl** has been appointed controller of the Cooper-Bessemer Corp., Mt. Vernon, Ohio. Mr. Kahrl assumes the position formerly held by **James E. Brown,** who has been named treasurer. Mr. Brown has held both offices but recently resigned as controller to devote his full time to the duties of the treasurer's office. Mr. Kahrl has been with Cooper-Bessemer since 1942 and joined the accounting department 2 years later.

• **G. Edward Conn, Jr.** has been elected to the post of executive vice-president and treasurer, and **Charles S. McIntyre** has been named vice-president in charge of sales and secretary of the Monroe Auto Equipment Co., Monroe, Mich. **J. E. Bickel** has been appointed sales manager of the company's parts and accessory division.

• **G. Edward Conn, Jr.** has been named manager of the newly-established York, Pa., branch office of Allis-Chalmers Mfg. Co. Mr. Conn has been employed by Allis-Chalmers since 1940, and since 1943 has been a salesman in the company's Philadelphia district office. **MacGregor G. Jones,** former resident representative at the Allis-Chalmers Harrisburg branch office, which has been discontinued, will assist Mr. Conn as sales representative.

• **Charles Mahoney** has been elected vice-president and a director of the William H. Bingham Co., Inc., Chicago. During the war, Mr. Mahoney was chief metallurgist and metallurgical superintendent of the Basic Magnesium, Inc., plant, near Las Vegas, Nev. Before joining the Bingham Co. he maintained his own consulting organization, known as Light Metals Engineering Service.

• **H. C. Edwards,** chief engineer of research and development, has been appointed director of research and development to succeed **J. F. Leahy,** who has retired, after 45 years of service with the Timken Roller Bearing Co., Canton, Ohio. **Walter F. Green,** assistant manager of research and development, has become manager of research and development.

• **Lance H. Cooper,** of London, England, a member of the staff of the Mond Nickel Co. for 20 years and one of its delegate directors since 1945, has been elected an assistant secretary and assistant treasurer of the International Nickel Co. of Canada, Ltd.

• **W. E. Brewster,** general superintendent of the Wisconsin steel works, has been appointed manager of operations for the steel division of International Harvester Co. with headquarters in Chicago. Mr. Brewster began his service at Wisconsin steel works in 1910. **R. A. Lindgren** succeeds Mr. Brewster as general superintendent. Mr. Lindgren started at the steel mill in 1923. He was promoted to blast furnace superintendent in 1936, and appointed assistant general superintendent in 1945. **F. M. Washburn** has been promoted from superintendent of metallurgy and inspection to assistant general superintendent. He began his steel mill service in 1919.

• **Ernest W. Polley** has been appointed assistant chief chemist for Youngstown district, Youngstown Sheet & Tube Co. Mr. Polley came to the Brier Hill plant as a chemist in 1928. Two years later he was transferred to the Campbell plant as a chemist and in 1935 returned to Brier Hill as general foreman in charge of the chemical department.

• **W. B. Peirce,** president of the American Society of Tool Engineers, has joined the staff of the G. C. Wood Co., Pittsburgh. He had formerly been with the Flannery Bolt Co.

• **Harry M. Day** has been appointed vice-president in charge of manufacturing for Ekco Products Co.'s eight domestic plants. Mr. Day, who has been director of research and technical assistant to the president, joined Ekco Products Co., Chicago, about 2 years ago.

• **Charles R. Sorber, Jr.** and **John L. Dawson** have joined the sales staff of the special chemicals division of the Pennsylvania Salt Mfg. Co., Philadelphia, and are now undergoing training. Mr. Sorber, prior to joining Pennsalt, was with Proctor & Schwartz. Mr. Dawson was formerly a salesman for the W. B. Davis Co.

• **R. M. Morrison,** general purchasing agent of the Texas Co., New York, since 1944, has been appointed manager of the purchasing department. He succeeds **R. S. Hatch,** who goes to Arabian American Oil Co. **Philip Hauck** succeeds Mr. Morrison as general purchasing agent. **W. G. Taylor** replaces Mr. Hauck as divisional purchasing agent, Chicago, and **F. G. Schlemmer,** assistant purchasing agent, Pacific Coast Div., becomes northern divisional purchasing agent at New York to succeed Mr. Taylor.

• **Irving H. Welinsky** has been appointed research chemist and assigned to general research for the research and development division of Pittsburgh Consolidation Coal Co., Pittsburgh. During the past 5 years he has been employed by Houdry Process Corp., where he served as head of the process research section. **Jack F. Chapin** has been appointed chemical engineer and assigned to operational work on the coal gasification pilot plant. Mr. Chapin had been on the MIT faculty staff for several years prior to military service. **William E. Lough** has been appointed chemical engineer and will be employed on the coal gasification pilot plant.

WALTER J. MAHANY, vice-president of operations, Southern States Iron Roofing Co.

• **Walter J. Mahany,** veteran of more than 20 years with the Southern States Iron Roofing Co., Savannah, Ga., has been named vice-president of operations for the firm. Mr. Mahany was elected a director of the company last year, and since 1945 has been manager of Birmingham operations. He joined Southern States as a sample-room boy in 1925 and has held important jobs in virtually all major company departments. **Hugh O. Nash** has been named director of the firm's Birmingham operations, with headquarters in Birmingham, replacing Mr. Mahany. Mr. Nash goes to Birmingham after managing the firm's factory and sales office in Savannah for several years.

• **L. W. Mercer,** vice-president of Square D Co., Detroit, will serve as general sales manager to coordinate sales promotion, advertising and overall sales policies of the firm's electrical divisions.

• **J. G. Reilly,** formerly in charge of specialized personnel work for Cutler-Hammer, Inc., Milwaukee, has been named general manager of the firm's industrial relations department to succeed **A. J. Holmes,** who has retired.

• **James D. Waser** has been appointed manager of the molded goods sales, Hewitt rubber division, Hewitt-Robins, Inc., Buffalo.

• **J. D. McCall** has been named general superintendent of the Pittsburg, Calif., plant of Columbia Steel Co. He succeeds **J. A. White,** who has resigned to take the position of plant manager at the West Pullman plant of the Ingersoll Steel Div. of Borg-Warner Corp. Other appointments of operating personnel for the sheet and tin mill now under construction at Pittsburg are: **D. E. Rice,** assistant general superintendent; **Donald W. Lasell,** division superintendent, sheet and tin mill; **Charles C. Morgan,** assistant division superintendent, sheet and tin mill; **William L. Clark,** superintendent, cold reduction sheet and tin mill; **T. L. Carroll,** chief industrial engineer, operating department; **Edwin E. Slagle,** works industrial engineer; **Walter W. Tryon,** assistant to works industrial engineer, and **Eliot R. Peck,** assistant to works industrial engineer.

• **Arnold A. Gustafson** has been made operations assistant to the general superintendent at Freeport Sulphur Co.'s Grande Ecaille mine in Louisiana. He joined the Freeport organization in 1934 and has held several positions with Freeport, including superintendent of production at the Grande Ecaille mine and manager of an exploration office at Toronto.

• **R. H. Newton** has been appointed to a newly-created office of manager of dealer sales for the Lincoln Electric Co., Cleveland.

• **Thomas J. Desmond** has been appointed sales manager for heavy chemicals of the Grasselli chemicals department of E. I. du Pont de Nemours & Co., Wilmington, Del. He succeeds the late **Howard E. Davis,** who died on Sept. 13. A new sales planning section has been organized, and **Henry H. Wolf** has been made manager. Mr. Desmond joined the Du Pont Co. in 1935. In 1943 he was made technical sales representative at Wilmington; in 1944 he was transferred to the Milwaukee sales office and in 1946 to Minneapolis. Since his transfer to Wilmington in 1939 Mr. Wolf has been assistant sales manager for heavy chemicals.

Ends Chronic Bearing Trouble

SUN BEARING LUBRICANT...

Eliminates Need for Frequent Dismantling

A big mill, making paperboard, was being slowed down by lubrication trouble on the drier rolls. Carbon accumulated regularly in the ring-oiled bearings, causing the rings to stick. As a result of improper lubrication, power consumption increased. The bearings had to be dismantled frequently. Meanwhile production stopped and maintenance costs piled up.

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• **George W. Scott** has been elected vice-president and secretary, Hotpoint, Inc., Chicago. He has held the latter position and that of treasurer since 1933. **Walter R. Grant** has been elected to the treasurer's post, relinquished by Mr. Scott. Mr. Grant formerly held a similar position with Locke Insulator Co., Baltimore.

• **F. C. Haralson** has been named regional store manager for the southeastern division of the replacement tire sales division of the B. F. Goodrich Co. He will have headquarters in Atlanta. Mr. Haralson first joined the company in 1929. In 1946 he became wholesale supervisor for the Atlanta district, a post he held until his latest promotion.

• **William E. Ireland** has been named merchandise manager of the International B. F. Goodrich Co., Akron, Ohio. He had been manager of replacement passenger car tire and tube sales for the parent company.

• **Winthrop B. Edwards** has been named manager of the Otis Elevator Co.'s works in Yonkers, N. Y., succeeding **John H. Hornung.** The change is effective Dec. 1, on retirement of Mr. Hornung after 47 years with the company, the past 9 years as manager at Yonkers. Mr. Edwards has been with Otis 43 years. Since the end of the war he has held the post of manager of the company's facilities division.

• **John H. Williamson,** assistant manager of industrial relations for the Tennessee Coal, Iron & R.R. Co., Birmingham, has been appointed manager of industrial relations. **Paul J. Bowron,** formerly assistant to the manager of industrial relations, has been appointed assistant manager, succeeding Mr. Williamson. **Elmer F. Harris** has been appointed assistant to the general superintendent of the Fairfield sheet and tin mills in other TCI personnel changes. **Clifford H. Bateman, Jr.** succeeds Mr. Harris as assistant superintendent of the Fairfield tin mill. **J. E. Hill,** former plant metallurgist for the tin mill, succeeds Mr. Bateman as metallurgical engineer, Fairfield sheet and tin mills.

• **E. W. Keller** has joined the Wayne Pump Co., Fort Wayne, Ind., as director of purchases. Mr. Keller formerly served as director of purchases of the American Bantam Car Co., Butler, Pa., and was purchasing agent for C. G. Hussey & Co., Pittsburgh.

• **Francis B. Mulvaney,** formerly contact metallurgist, alloy bureau, Carnegie-Illinois Steel Corp., Chicago, has been appointed metallurgical representative for A. Finkl & Sons Co., of Chicago. Mr. Mulvaney will cover the St. Louis area in his new position.

• **Archibald H. Ballard** has been appointed assistant director of research for Norton Co. of Worcester, Mass. Mr. Ballard will be in charge of the company's research laboratories at Chippawa, Ont., where he succeeds **Raymond R. Ridgway,** who died recently. Mr. Ballard became associated with Norton Co. in 1926. Since then he has advanced progressively through group leader, section head and research engineer to his present position. He will be assisted by **Wallace M. Hazel,** chief chemist, and **Fred H. Young,** control engineer. **Guy H. Fetterley** now becomes research engineer responsible for the products research section and **John A. Tupper,** research engineer responsible for the manufacturing control section.

• **James E. Gleason** has been named chairman of the board of the Gleason Works, Rochester, N. Y. **E. Blakeney Gleason** has been selected as president, and **Arthur L. Stewart** has been designated vice-president. E. Blakeney Gleason will retain the office of treasurer as well as continuing in the capacity of general manager, two positions which he has occupied for a number of years. Mr. Stewart will remain as chief engineer. **Lawrence C. Gleason** has been elected a director of the Gleason Works. James E. Gleason has been connected with the company since he started his apprenticeship there in 1884. He has been president of the Gleason Works since 1922, and he was general manager until 1943. Following the occupancy of a number of positions in the company, with which he became connected in 1927, E. Blakeney Gleason was elected a director in 1934. Mr. Gleason became second vice-president in 1934, and he was appointed assistant general manager in 1935, and treasurer of the company in 1936. He was appointed general manager in 1943, and his designation as first vice-president took place in 1945. Mr. Stewart joined the Gleason Works in 1909 and became chief engineer in 1917. His election as a director took place in 1922. Lawrence C. Gleason who was long active with the Gleason Works as an officer and director, was elected assistant treasurer in 1938.

• **Carl J. Koelsch** has been appointed steel buyer for Budd Co.'s Detroit division. Mr. Koelsch has been director of purchases for Fruehauf Trailer Co., Detroit, for the past 3 years.

• **Frank K. Savage,** past president of the American Electroplaters' Society, has joined the Standard Plating Rack Co., Chicago, as assistant to the vice-president.

• **Milton E. Hohnbaum** has been appointed traveling freight and passenger agent of the Wabash R.R. Co. with his headquarters in Dallas. He succeeds **Grover C. Brook** who has retired. **Chester A. Rose** has been appointed perishable freight agent at San Francisco, succeeding **Clarence L. Nelson,** deceased.

OBITUARY...

• **W. Gibson Carey, Jr.,** 51, president since 1932 of the Yale & Towne Mfg. Co., New York, died suddenly Oct. 4.

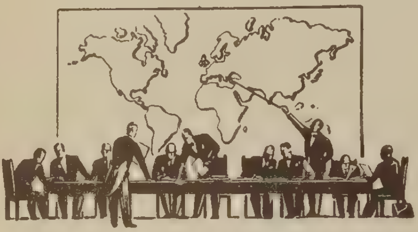
• **Edward C. Hanpeter,** 85, president of the Spuck Iron & Foundry Co., St. Louis, died Oct. 2.

• **David McCoy,** vice-president and general sales manager of the Steel Co. of Canada, Ltd., Hamilton, Ont., died Oct. 5 after several months' illness.

• **J. Frederick Martin,** 71, president of the King Fifth Wheel Co., Philadelphia, died Sept. 4.

European Letter . . .

• UN Security Council hampered by voting process . . . British recognize American intent to stay in world organization . . . U. S. is determined to work for a more effective UN.



LONDON—Two questions dominated public thinking at the time when Mr. Truman's request for immediate aid to Greece and Turkey gave public notice of a sharp change in American foreign policy. The first, asked of the State Dept. by the Senate Committee on Foreign Affairs, was, "Does this new policy mean war?" The second, asked even more anxiously by the interested public, was "Does this mean that the United States intends to bypass the United Nations?"

Both questions were, of course, two facets of the same problem. If it was the business of the Senate Committee to find out whether war lay ahead, it was even more painfully the business of the public to find out how war could be avoided, and to cling with deep anxiety to the organism which had been devised for the express purpose of preventing it.

The Foreign Affairs Committee of the Senate was assured that the new policy did not mean war, and public alarm was soothed in a speech by the then head of the American delegation to the United Nations, who told his international confreres with almost indignant warmth that no slight had been intended.

Nevertheless, the specter would not lie quiet. In the week of thunder and great winds, which ushered in the second session of the United Nations Assembly, Secretary Marshall undertook to furnish a reply which, answering one question in a manner which should satisfy both the American public and the world, underlined the other.

What Mr. Marshall has made abundantly clear is that the United States desires to make its moves not as an independent force but within the framework of the United Nations. Far from intending to bypass that organization, as the well-wishers of UN feared last spring, the American desire is that of a man confronted with a recalcitrant motor car—to open up the works and get the thing going.

THE proposed cure is directed at the most obvious trouble. The Charter put the keeping of the peace into the hands of the Security Council. Two years' experience has shown that the effectiveness of the Security Council is severely hampered by the voting process provided for it.

Because that voting process was agreed on only after long and difficult negotiation, at home as well as abroad, the United States (which bears its share of responsibility for the sticky veto) would not undertake at this moment to seek its revision. It can, however, gain the same effect if additional machinery is set up within the larger Assembly.

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The reception accorded to this proposal at home, where most people seem to have forgotten that the veto was not a Russian invention, was greatly aided by Mr. Vishinsky's violent indictment of Britain and the United States, which followed close on its heels.

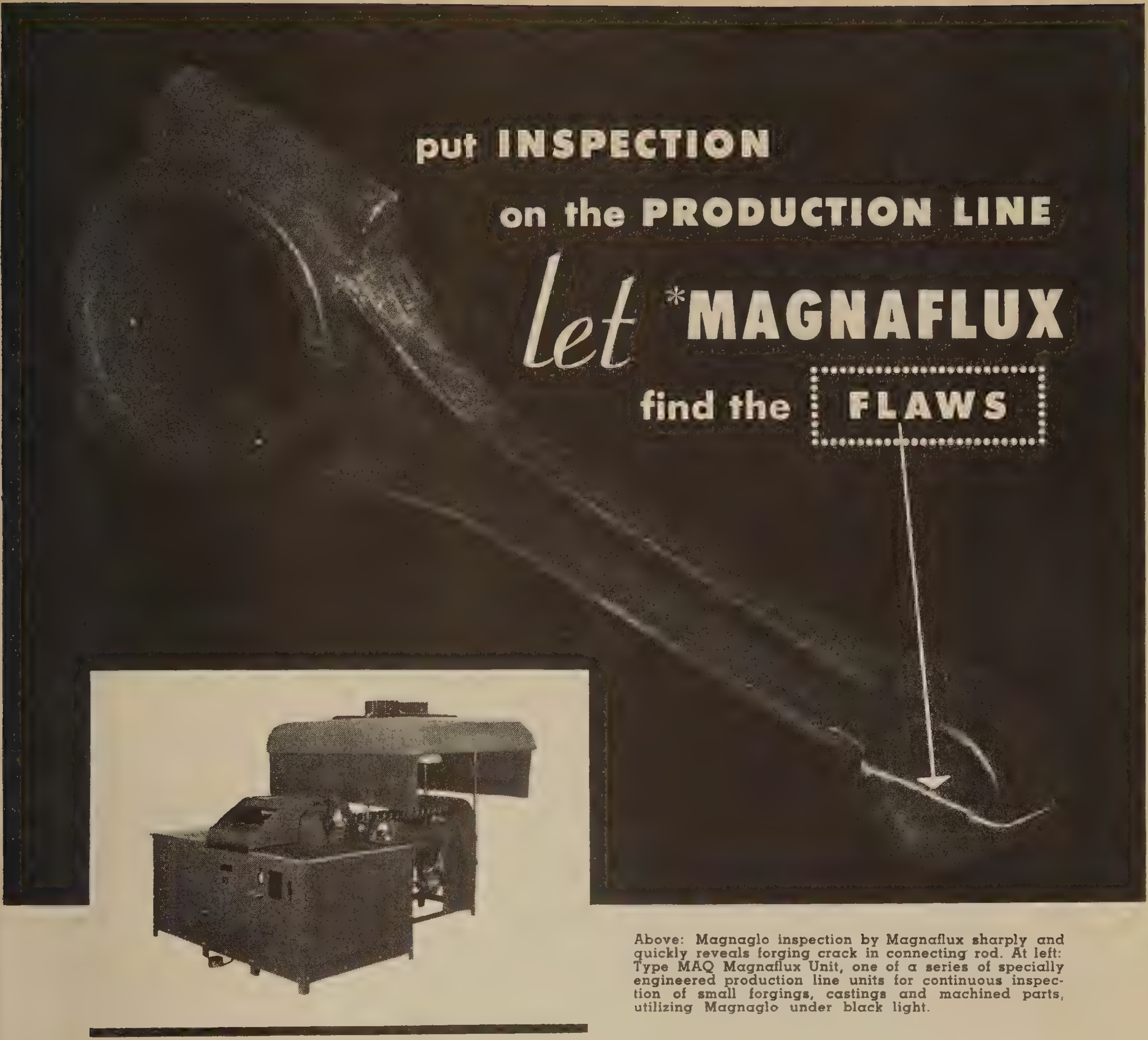
For the purpose of the State Dept. the timing could scarcely have been improved. On Wednesday Mr. Marshall proposed a way whereby the existing machinery for settling such disputes as those concerning Greece and Korea could be supplemented and the whole process of peace-keeping rendered more effective. On Thursday Mr. Vishinsky said that the United States and Britain were plotting war. He also, and as an addition to a speech clearly planned before he left Moscow, indicated that Mr. Marshall's proposal would be unacceptable.

IT is too early to tell what may be the effect on the young structure of the United Nations of Mr. Marshall's new plan, or of any derivative or substitute that may be adopted. The organization was born and bred in crisis, and its success in surmounting trouble thus far is perhaps not so much a tribute to its inner strength as to an imperative recognition on the part of delegates that they dare not for their very lives rest content with pessimism and failure.

Memories of the past both hamper and help. Some have feared that the United States, which took no part in earlier international action, would find the process too trying; others fear that it would be Russia which, walking out too often in the past, would depart in the present.

So far as American patience is concerned, such fears should now be set at rest. Mr. Marshall gave every indication that the United States is determined to work for a more effective UN even if such action has the effect of pushing Russia out.

The Russians, for their part, show every sign of intending to stay and fight the battle along the lines Mr. Vishinsky laid down. They have the world gathered in open forum before them to hear their complaints, and if their linking of Britain and the United States as political partners in aggression seems strange at a moment when those nations might conceivably be driven apart on economic lines, it must be remembered that if the two can be linked as culprits in the Near and Far East, it may profit the Soviet more than though they were divided in the West.



Above: Magnaglo inspection by Magnaflux sharply and quickly reveals forging crack in connecting rod. At left: Type MAQ Magnaflux Unit, one of a series of specially engineered production line units for continuous inspection of small forgings, castings and machined parts, utilizing Magnaglo under black light.

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Industrial News Summary...

- ***Scrap Market Turns Upward***
- ***Prices Fail to Meet Test***
- ***Steel Supplies Are Tighter***

AS if it were not battered enough by shortages, production difficulties and hysterical delivery pressure, the steel industry this week was receiving the full impact of higher scrap prices and the emergency increase in freight rates. In the latter case, there was little consolation for steel consumers. With higher freight costs effective on steel shipments a further withdrawal by steel firms from distant markets is a certainty because present steelmaking costs will not stand too much of an increase in freight absorption by steel companies.

The highly explosive scrap market, which has held still during the past several weeks while brokers covered old orders taken at higher prices some time ago and consumers entered into more complicated conversion deals, has blown its top. The average price of No. 1 heavy melting steel this week is up $2.25 a ton at Pittsburgh and at Philadelphia the average price of the same grade is up $2 a ton. There was no change at Chicago, but in view of higher prices at Boston, New York, Pittsburgh and Philadelphia a reaction in the Chicago area is expected soon.

THE IRON AGE scrap composite price this week (based on the average price of heavy melting steel at Pittsburgh, Philadelphia and Chicago) stands at $39.50 a gross ton, up $1.42 a gross ton from last week. This price compares with the high of this year reached in the week of Aug. 5 when the composite was $41.67 a gross ton and the low in the week of May 20 when the composite was $29.50 a gross ton.

WHILE some scrap consumers insist that supplies are greater than a few months ago the long term outlook on scrap is anything but reassuring. Recent price levels were more or less nominal and it is only recently that they have been severely tested—with the result that scrap prices are again moving upward. Agents of steel firms which are selling steel ingots in the open market for as much as $80 to $90 a ton have made their influence felt in scrap centers where they have bid for available material.

Faced with tremendous pressure to deliver scrap to support current high operating rates, a few scrap dealers are reported to have put concrete, dirt and other foreign matter into steel scrap. This has been loaded into presses which bale sheet steel into No. 2 steel bundles which bring the same price as heavy melting steel. So serious has the practice become that responsible scrap men have strongly protested with a warning that it poses a threat to the entire scrap industry.

At one steel mill alone it was indicated that 10,000 tons of steel were lost as a result of "foreign matter" in bundled scrap. Since this producer has been making his steel from a charge including about 60 pct hot metal and 25 pct scrap generated in his own plant the high ratio of foreign matter in some of the bundles bought on the outside was particularly obvious.

The steel industry this week has come within striking distance of practical capacity operation and total output this week will match previous postwar records. Activity this week at 97 pct of rated capacity up ½ point from last week on an annual basis would be almost equivalent to 89 million tons of steel—a figure not reached since 1944. Further important increases in steel output will be held in check by lack of coke and pig iron as well as the increasing difficulty in obtaining steel scrap.

BECAUSE of the increase in freight rates this week steel mills shipping over long distances on competitive sales to customers located near another producer's basing point will have to absorb more freight—in dollars and cents—than other steel competitors whose mills are near that basing point. It is almost certain that some steel firms will withdraw some low profit products from certain markets. This has been the trend in recent years as the amount of freight absorption increase on a percentage basis. Coal, coke and iron ore are affected by the recent freight rate increases with the result that the steel industry's raw material bill is on its way up again.

Steel fabricators whose location is such that they must pay heavy freight charges for their steel will be directly affected by the higher freight rates on steel to their fabricating plants. The more remote these plants are from their source of supply the greater the increase will be in the total delivered price including freight on steel shipments.

Most steel consumers are behind the eight ball as far as their steel supplies for December are concerned. Substantial cuts have been made in the quotas originally set up for the last quarter of this year. Many large steel fabricators will not get the total supplies which they have been promised some time ago. Main factors causing this were production difficulties, coal mine shutdowns last summer, and the outlaw railroad strike affecting plants in the Pittsburgh district recently.

In attempting to overcome their desperate supply situation customers in general have three alternatives in view of the rapidly diminishing steel deliveries: They can turn to the gray market in an attempt to pick up what they need; arrange for conversion by buying ingots or semifinished steels; or choose a substitute.

The gray market and conversion deals are now being played to the limit. Metal consumers are now realizing that the only undeveloped source with which they can augment their supplies lies in the replacement of steel by other products—and aluminum is being no slouch in this situation.

• **NEW RECORD**—A new weekly postwar production record of more than 400,000 tons of steel ingots was set by the mills of Carnegie-Illinois Steel Corp. during the week ending Oct. 4. The record Carnegie-Illinois output, which totaled 403,641 tons, was produced at the rate of 102.2 pct of theoretical capacity for the eight steel producing plants of the company in the Pittsburgh and Chicago districts.

• **COAL EXPORTS**—November coal exports will be limited to a total of 3.5 million tons, of which 3 million tons are allocated to Europe and 500,000 tons for other overseas destinations. This is a drop of a half million tons from October quotas. Although the November allocation is less than the projected last quarter monthly rate, this is balanced by overshipments during the second and third quarters.

• **MORE TIME GIVEN**—Steel corporations named as respondents in the Federal Trade Commission's basing point complaint against the industry and the American Iron & Steel Institute have been given additional time to file replies with the commission. The deadline for the respondents' answers now is Nov. 1, an extension of more than 3 weeks from the previously set date of Oct. 8.

• **IRON ORE CONSUMPTION**—Consumption of Lake Superior iron ore by U. S. and Canadian furnaces during August totaled 6,637,835 tons compared with 6,156,401 tons in July and 6,738,409 tons in August a year ago. For the season to date, U. S. furnaces have used 51,122,453 gross tons and Canadian furnaces 1,902,435 tons, compared with 36,197,805 tons and 1,242,925 tons respectively for the same period a year ago. Cumulative consumption for 1947 amounted to 53,024,888 tons compared with 37,440,730 for U. S. and Canadian furnaces in 1946. Stocks of ore on hand at U. S. furnaces Sept. 1, amounted to 29,096,633 gross tons, while stocks at Canadian furnaces totaled 1,300,655 tons and ore on Lake Erie docks, U. S. only, amounted to 3,499,174 tons, making total stocks on hand Sept. 1 of 33,896,462 gross tons. This compared with total stocks on August 1 of 28,440,332 gross tons and with 34,066,987 tons on Sept. 1, 1946 according to the Lake Superior Iron Ore Asso.

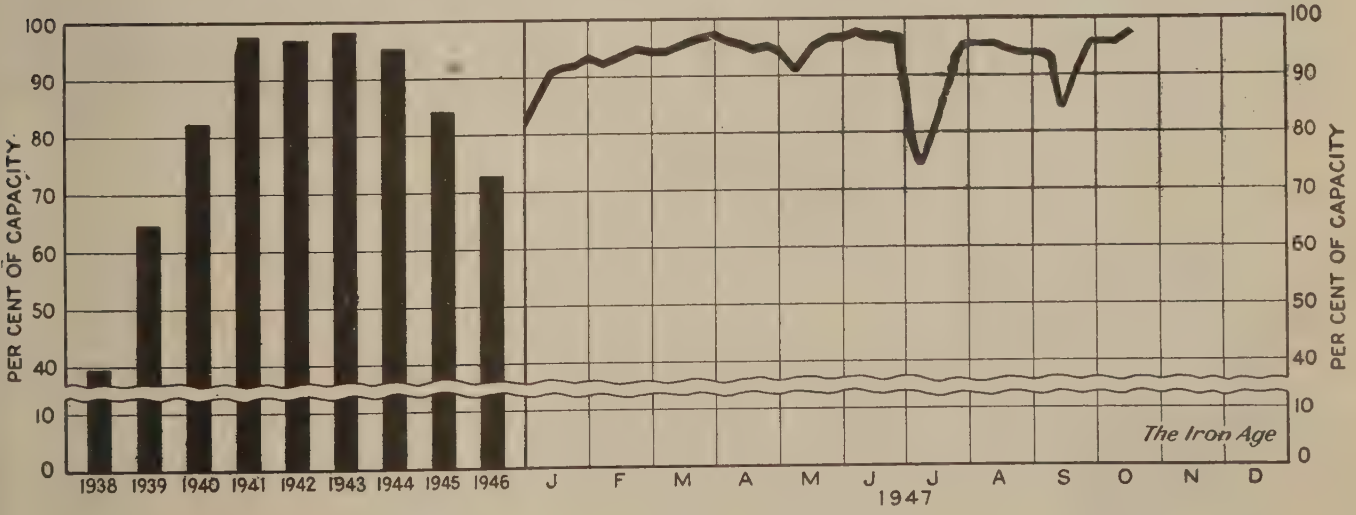
• **MORE COKE COMING**—Carnegie Illinois Steel Corp. recently awarded Koppers Co. a contract to build a new battery of 85 byproduct ovens and rebuild a 61-oven battery at the Clairton, Pa., works. This new construction is one of the larger projects in U. S. Steel's expansion and modernization program. Work will start at once on the new battery and completion is expected by November 1948. The rebuilding job will begin next year and will require 14 months. Clairton, world's largest coke producer, will have 1567 ovens when the new unit is finished.

• **STEEL PRODUCTION**—In the first 9 months of 1947, production of steel was only 6 pct short of the amount produced in the entire year 1940, record peacetime production year, according to the American Iron & Steel Institute. The output of steel ingots and steel for castings in 9 months of 1947 was 62,611,051 net tons. In the year 1940 production totaled 66,982,686 tons. The steel operating rate during the first three quarters of 1947 averaged 91.7 pct of capacity. September 1947 output at 6,775,158 net tons fell below the August total of 6,982,086 net tons, with the decline attributed to the shorter month and a strike affecting a railroad serving steel plants.

• **TRACK LAYING PLANS**—Plans for the expenditure of $14,600,000 for 650 track miles of new rail for Union Pacific Railroad were announced recently. The new rail, of which all but 18 track miles is heavy duty rail weighing 133 lb a yard, will be utilized in track relaying projects at various points along Union Pacific's 10,000 miles in 1948.

• **STEEL INVENTORIES**—Manufacturing concerns and railroads consumed 97 pct of the steel they received in the first 6 months of 1947, the Commerce Dept. reported last week in a survey of steel inventories. Industries consuming more than 10,000 tons of steel in the first half used slightly more steel sheet and strip than they received, while consumption of other steel was slightly less than receipts. Railroads reported higher inventories for June 30 than for Dec. 31, 1946. Manufacturing concerns' figures are based on reports from 1700 firms. Commerce Dept. statisticians selected their sample from among a large group of companies which in 1943-1946 are estimated to have shipped about 80 pct of all metal products.

Steel Ingot Production by Districts and Per Cent of Capacity



Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
October 7......	105.0	95.5	90.0	92.0	94.0*	102.0	100.0	99.0	102.5*	107.0	98.5	80.0	94.0	96.5
October 14.....	105.5	95.5	92.0	92.0	98.0	102.0	100.5	99.0	97.0	108.0	106.0	80.0	94.0	97.0

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Marshall Plan Calls for 2 Million Tons of Raw Steel

Washington

• • • **Two million tons** of ingots and semifinished steel, plus 900,000 tons of finished steel products, represent the first year steel needs of the Marshall Plan, it was learned here this week. In addition to the actual material needs of the plan, the Western European countries are also expecting the United States to tacitly underwrite the British steel industry modernization program (See THE IRON AGE, May 23, 1946, p. 114) and the steel section of the French Monnet Plan (See THE IRON AGE, Dec. 18, 1946, p. 98.).

When the two above proposals were described they were primarily matters of national concern. The French economic officials decided in 1946 what future they wanted for their own steel industry. They drew up a modernization program designed to raise French steel output to 12 million metric tons in five years as part of a national economic plan. At the request of the British government the British Iron & Steel Federation drew up an expansion plan to make the industry in that country a 16 million ton one in 5 years.

The proposals for the Marshall plan are to incorporate these two national plans, virtually unaltered, into the total structure. A similar action is planned in the case of Belgium, although the Belgian industry has been secretive on even the broad outlines of its plan.

The British industry is making the assumption that it will always be able to import a substantial tonnage of semi-finished steel. Britain is planning to get 75 pct of the 2 million tons of raw steel asked for every year in the Marshall Plan. The United Kingdom is also expecting heavy scrap shipments from the United States under the Marshall Plan, and is planning to operate on imported scrap in the future.

Remembering past experience, American officials will need to recognize in advance that, despite the fact that the availability in this country has not been studied, if at any time in the next 4 years Britain does not get enough ingots or semis, or scrap from this country, U. S. will be blamed.

Britain and France Hope Plan Will Help Rehabilitate Their Industries

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By JACK R. HIGHT
Associate Editor

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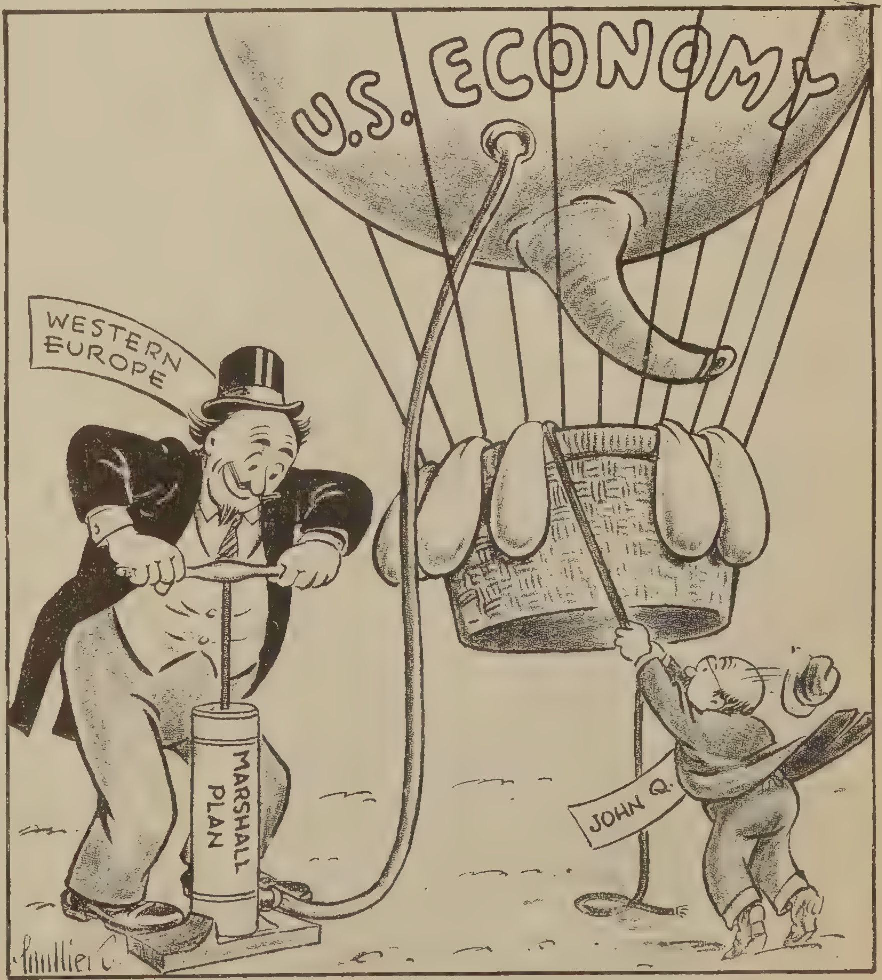
What becomes increasingly evident is that the Paris conference did not do as much toward coordinating the various national plans as had been hoped in this country. The conference was, of course, up against almost insurmountable difficulties. The time was too short, much statistical information was lacking, and fear was the dominant feeling in the air. One theory that was in the mind of all the participants was that, if a workable plan could be evolved to get the program under way as quickly as possible, corrections and details could be added later.

Considered on this basis, it is certainly desirable to get the Marshall Plan under way as quickly as possible, and for the first year or two the long term steel industry plans of the European countries should not pose any problems.

The impact of the Marshall Plan on the domestic economy of this country will not be felt until about the beginning of the third quarter of next year. Progress that may be made in a possible special session this year will be emergency aid to France and Italy, while the broad aims of the Marshall Plan

Can He Hold It?



will be taken up no sooner than in the regular session next year.

Discussion of the plan in Congress is expected to take at least two to three months. The administration cannot be effectively set up in less than 60 days, and purchasing undertaken in May or after will not begin to be felt in the heavy industry of the United States until 30-60 days later, at least. Of course, the European countries will do everything possible to accelerate this time table. Britain has taken the precaution of bringing its purchasing officials along.

A struggle is going on at the moment between the groups headed by Interior Secretary Krug and Commerce Secretary Harriman on the one hand and the State Dept. on the other. The former groups are of the opinion that the United States should set up a powerful supervisory body to see that the most desirable economic ends for the benefit of the most European people are achieved by every dollar spent in Europe.

Krug's and Harriman's committees would like to feel that power plants and refineries that must be built will go to the best possible location, without regard to the national boundaries in Europe. The committees (possibly cynically conditioned by the decades-old history of pork-barreling government relief among the 48 states) are sure that unless an American supervisory body is set up, the economic ideal will never be reached.

The State Dept. considers that setting up such a body to, in effect, dictate where and how the money should be spent, would only heap more kindling on the "Dollar Imperialism" fire. At the moment, there is apparently no mutually acceptable compromise between these two points of view.

Regardless of the decision on an American directing body for the Marshall Plan, there is certain to be a joint committee representing all the benefiting nations and the United States to actually direct the administration. This may be simply a continuation of the consultative body organized in Paris, with the addition of appropriate American officials.

Steel officials are getting a chance this week to study the tonnage requirements for the plan. The scrap and semi-finished steel needs may prove the most difficult to the industry in this country.

Summarizing the report concerning the scrap situation, Vol. 1 of the Paris report says in part: "It is not easy to evaluate the future scrap supply. The fuel and scrap supply positions react upon each other, and an easement in fuel supplies might bring an unexpected easement in scrap supplies. At best, however, a deficit of 1 to 1½ million tons of scrap a year must be expected; such a deficit can only be met, as it was before the war, from United States sources."

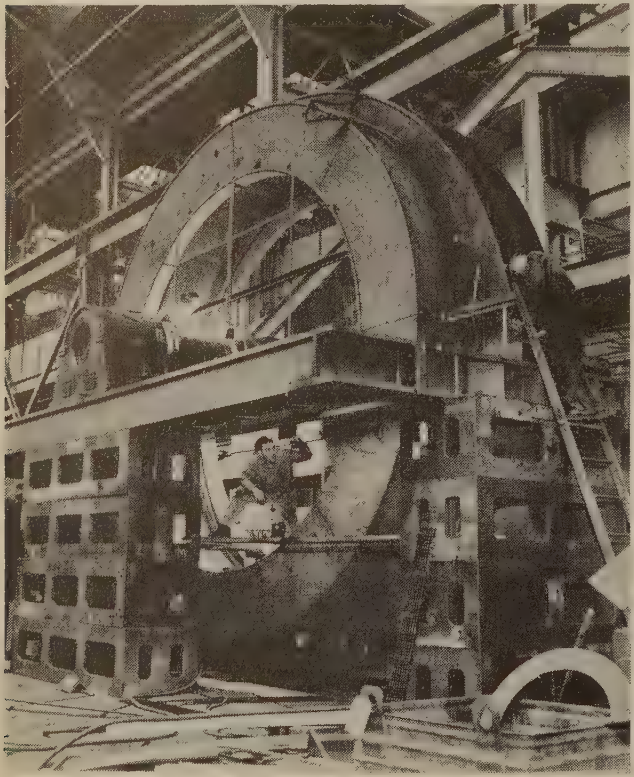
Provision has been made for annual shipments of 2 million tons of scrap per year in the actual total import requirement tables. In connection with this need, it must be noted, that the officials who wrote the report at Paris explain that they made no effort to ascertain the availability of any of the materials in the U. S. The point they make is that at Paris they were concerning themselves only with need.

This scrap tonnage, although it may have been available during prewar days, will certainly be subjected to further reduction before the Marshall Plan is approved. Steel men in this country are already sufficiently concerned about the future of scrap supplies domestically that they are expanding pig iron capacity to permit a reduction in scrap requirements.

Most of the scrap is designed to aid the industries in the United Kingdom and Italy. Both countries have already been bending every possible effort toward the maximum collections since the end of the war. The need certainly exists, as far as these two countries are concerned. Generally speaking, there is no alternative to the scrap shipments other than the unlikely possibility of a sudden discovery of a bottomless pit of high grade coke. Barring these scrap shipments, steel production is sure to be reduced in both Britain and Italy.

Of the 2 million tons of semi-finished steel required annually during the four years covered by the plan, 75 pct is to be allocated to Britain, and the remainder to Italy. The large requirement for the United Kingdom represents in part the tonnage which that country bought on the Continent before the war, and also some slight increase to permit an expansion of total production. This requirement is actually not a new one. Approximately the same amount would have been purchased in this country each year since the war, had supplies been available.

Tinplate and sheet export requirements for the plan for the first year total 250,000 tons, and will gradually increase until they hit nearly ½ million tons in the fourth year of the program. Es-



110 TON MOTOR: *When installed this 4000 hp motor will drive a new Mesta roughing mill in the Fairfield, Alabama plant of the Tennessee Coal, Iron and Railroad Co. More than 27 ft. wide and 24 ft. high, it is rated at 6600 volts, three phases, and 60 cycles. The great power at low speed required by the roughing process dictated the size of the machine.*

isting estimates of actual production and minimum consumption requirements for Germany next year indicate that there will be a shortfall of 900,000 tons of finished steel for Germany alone next year.

Considering the total production and consumption of the sixteen participating European countries on a simple statistical basis, there will be a surplus of 300,000 tons of finished steel. This excludes sheet and strip and the total German need. Thus, the approximate result would be that there is a need for 600,000 tons of finished steel other than sheet and strip and 700,000 tons of sheet and strip for 1948. The sheet and strip and tinplate tonnage is to be divided, but most of the other products will be needed by Germany.

All of the above statistics which have been used for steel production are based on fairly optimistic estimates of what can be done. Actually the situation may be much more serious than the above outline indicates. The whole coke problem for Europe is one that the committee has studied in great detail. There is to be a deficit of 12.6 million tons of coke for the European countries next year.

There are a number of suggested avenues of approach to this problem, but none of them will be easy. In no country is there a sufficient spare tonnage of coke to make up the loss. Success in making up the shortage will only be possible if drastic conservation measures are adopted everywhere to free the high grade coke required for steel making.

Iron ore problems are not serious for the first 2 years, but may become so during the last years of the plan. Great difficulties have been met in drawing up programs in any line further than two years in advance, and most of the 1950-51 figures are admittedly vague estimates. Ore figures used are certainly in this category. The committee has come to the preliminary conclusion that by 1950 there may be a serious shortage of high grade ore, but there is a difference of opinion among technicians on this subject.

Appraising the total raw material supply situation, the committee feels that shortages other than coke may mean a loss of 1¾ to 2 million tons of steel under the estimate for next year, rising to possibly three million tons in 1951. This would represent about 5 pct of the estimated production. If the coke deficit can be reduced to 4 million tons, the total steel output reduction would probably amount to about 6½ million tons below the estimate, or about 15 pct.

The participating countries are, according to the report, planning for steel supplies "to cover not only their domestic consumption needs, but also exports to outside markets. Western Europe is traditionally a big exporter of finished steel. These exports not only represent an essential contribution to the foreign exchange resources of the participating countries, but they are also closely linked with other aspects of Western Europe's trade and enterprise abroad . . . "

Steel Pipeline For Oil of Arabia Will Continue in Export

Washington

• • • **Pipe for the oil** of Arabia will continue to be exported, probably in such quantities as may be needed in construction of the Trans-Arabian pipeline, regardless of critical needs of the domestic petroleum industry. This is the conclusion to be drawn following a closed meeting on Oct. 9 between the Senate Small Business Committee and the heads of the Depts. of Commerce, State and Defense.

The meeting was called in an attempt to settle the $64 question of whether shipments for the Saudi-Arabia project are justified in view of domestic needs. While lesser officials had previously been heard by the Committee's steel subcommittee concerning exports in general, this was the first time that agency heads had been called together.

The Committee was told by Secretary of Defense Forrestal that the Trans-Arabian pipeline must be completed at all costs—that it is "essential to the national interest." He further declared that in his opinion "it should come ahead of pipeline developments in the United States and the western hemisphere.

All in all, the Committee was told, a total of 480,000 tons of pipe will be required by the Trans-Arabian project by Jan. 1, 1950. Of this amount, 305,000 tons will be needed for actual construction and the remainder for maintenance.

However, the State Dept. may allot still other amounts to take care of "special projects." These ex-quota and special allotments have been of grave concern to the Committee. It has been unable to determine the extent to which they are utilized in export allowances. It certainly was no comfort to the Committee to learn that the current fourth quarter allotment for Saudi-Arabia tacked onto the regular foreign quota. This has the effect of increasing fourth quarter shipments of pipe from 30,000 (quota) tons to a total of 50,000 tons.

None of this has worked to change the conviction of the Committee that exports constitute one of the most important factors in creating the current steel shortages, not only in steel pipe but in other categories.

"The Committee has found," Senator Wherry says, "that total exports are on the rise at the rate of what appears to be 1.5 million more tons this year than last. Total exports of finished steel in 1946 were 5.1 million tons. In 1947, finished steel products are being exported at the rate of 6.5 million tons for the year. Exports of such critical items as sheet steel and steel pipe and tubing have doubled and trebled in 1946 and 1947 over normal prewar years."

Mr. Harriman has assured the Committee that he is endeavoring to consolidate export allotments by abandoning the ex-quotas. Hereafter, he is said to have told the group, pipe exports will be allotted by means of specific quotas.

At least one member, if not more, of the Committee is known to feel that unless the Senate group rides herd on the government agencies, particularly in view of the proposed Marshall plan, domestic consumers might get the short end of the deal.

In the meantime, the Committee will continue hearings on the oil and pipeline problem. One is scheduled for California late in October and another will be called in Washington in early December.

Poor Preparation and Overgrading Add to Scrap Buyers' Troubles

Scrap Institute Asks More Care in Baling Bundles As Rejections Soar

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By GEORGE F. SULLIVAN
Pittsburgh Regional Editor

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Pittsburgh

• • • **Stagnant scrap prices** during the past 2 months have masked some of the strangest deals in the history of the trade. Prices held firm for the longest period since the end of OPA and have only recently begun to move. But well informed sources say that overgrading and poor preparation have been running wild; rejection of cars has skyrocketed.

Further, there is evidence throughout the country that conversion deals are increasing, and strengthening scrap prices. This is explained as the process in which a steel consumer buys ingots for conversion into sheets. He generally pays well above openhearth producers published prices for these ingots and applies considerable pressure on the ingot producer to deliver without regard for what it may cost the ingot producer for his scrap.

Mill scrap buyers declare that some dealers have been "exceedingly careless" in baling No. 2 steel bundles. They say this carelessness has gone beyond a few bundles containing foreign matter. Wood, glass, linoleum and similar items affiliated with automobiles and railroad cars inadvertently slip in, say the purchasing agents, but some recent shipments of bundles have been liberally sprinkled with bricks and concrete. Rejections have mounted to scores of cars of No. 2 bundles until some mills have flatly refused to accept any further shipments of this grade. Others are cutting the bundles open and inspecting for foreign matter.

From reliable sources here it is indicated that few dealers are involved, and there is no evidence that the heavily rejected shipments originated in this district. Because the matter is still pending, the origin of one of the heaviest rejection cases cannot be disclosed at this time.

The result of charging some of these bundles has been loss of a number of heats of openhearth steel. "If we had lost only one or two heats," said one steel mill purchasing man, "We wouldn't be kicking. But it goes farther than that."

So serious was the situation here recently that Edwin C. Barringer, secretary, Institute of Scrap Iron & Steel, wrote to members in part as follows:

"Two important producers of steel—each the largest buyer of scrap in its district—have called the attention of the institute to the poor quality of scrap—especially No. 2 bundles, which they have been receiving . . .

"This is not to condemn every shipper of scrap. The majority are maintaining tonnage and quality under severe handicaps. But there are just enough poor shippers to jeopardize the entire industry."

While the No. 2 bundle market has come in for the sharpest criticism, there are indications that the low phosphorus grade has not been following a normal pattern. When price control was instituted this grade was pegged at $2.50 above the price of No. 1 heavy melting steel. Recently, spreads of $7 to $8 here have been posted. Grading has broadened out to include such specifications as 5-ft low phos and other terms which permit a price which—while higher than the No. 1 steel quotation—is still well below that quotable for 3-ft low phos of official specifications.

Reliable observers say this practice permits purchase of openhearth and electric furnace steel at a price that doesn't affect the going market price for No. 1 heavy melting steel. In Pittsburgh, for instance, some "low phos" has moved at just a few dollars above the No. 1 steel price. But as long as both buyer and seller agree it is low phos, that is what it moves as. Meanwhile, good low phos moves at well above this figure.

Perhaps the most perplexing feature of today's market to those who have been in it before the war is the way in which Pittsburgh delivered prices have broken away from their former relationships. Before the war, say these sources, the price of scrap within several hundred miles of Pittsburgh was based on the delivered Pittsburgh price. The seller had to meet the Pittsburgh quotation, and regardless of how far he was from the steel city within this normal market radius of several hundred miles, he had to absorb the freight into the Pittsburgh mills. This situation no longer prevails and recently there has been an increase in the tonnage and the price of material moving into local mills from suppliers outside the district. This, say oldtime trade observers—has produced a price situation throughout the country that has no historical basis and adds to the uncertainties and instability of the market here.

To Receive ASM Medal

Cleveland

• • • **The American Society** for Metals has announced that Charles R. Hook has been elected to receive the society's medal for the Advancement of Research for 1947. Mr. Hook is president of the American Rolling Mill Co., Middletown, Ohio.

Award of the medal, plaque and citation will be made at the annual banquet of the American Society for Metals to be held in Chicago on Oct. 23 during the National Metal Congress and Exposition, principal international event of the metals industries.

From 1938 until the present time, Mr. Hook has served in numerous important advisory capacities to the federal government both at home and abroad. He is currently a member of the Business Advisory Council of the U. S. Dept. of Commerce and also serves as a member of the National Industrial Conference Board.

Weekly Gallup Polls . . .

Selling Marshall Plan to U. S. Public Presents Problems

Princeton, N. J.

• • • **The Truman Administration** faces a serious problem in winning full public support for the Marshall Plan, according to George Gallup, director, American Institute of Public Opinion.

The problem grows out of lack of public familiarity with (1) the plan itself, and (2) the situation in Europe which the plan is designed to meet.

Proof of the existence of the problem is that Americans who are the most familiar with the Marshall Plan give it a favorable vote. Those not familiar with it give it an unfavorable vote when the plan is explained to them in terms of lending money to help European countries.

The first hurdle which the State Dept. faces is that only about half the voters of the nation say they have heard or read of the Marshall Plan.

From coast-to-coast interviewers for the institute asked voters:

"Have you heard or read about the Marshall Plan?"

The vote:

	Pct
Yes	49
No	51

Those who have heard of the plan were then asked this question:

"What is your understanding of the purpose of the plan?"

A great deal of vagueness and confusion in the public mind is revealed in the answers to that question.

About one in five gave an essentially correct definition—that is, a plan for European recovery which supplements self-help on the part of European countries with needed assistance from us.

The rest have a less complete idea, varying from those with a very general notion down to those with only a vague idea or no idea at all of what the plan means.

When all those groups were asked, "What is your opinion of the plan?" it was found that most of them had a favorable opinion in general, the proportion of favorable answers being highest among the best-informed.

But when the plan is explained in terms of extending loans for billions of dollars to certain European countries, in order to help them get back on their feet, voters with little previous knowledge about the plan express unfavorable views.

On the basis of this evidence it would appear that the support given by the public to Secretary Marshall's key item of foreign policy will depend almost entirely on how the government, the press and other mass media explain the plan during the next few weeks and months to those who have little or no familiarity with it now.

This is indicated in answers to the following question:

"Would you favor or oppose lending Western European countries like England, France, Holland and Norway about $5 billion a year for 3 or 4 years to improve conditions and help get business going in their countries?"

The vote by the various groups follows. Note how the favorable vote drops and the opposition rises according to degree of information of the voter.

	% Favor	% Opposed	% Qualified	% No Opin.
Those best informed about Marshall Plan	49	34	10	7
Those less well-informed	40	41	14	5
Those with only vague ideas about plan	34	46	13	7
Those who don't know what plan is	25	54	10	11

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• • • **The average American** takes a dim view of the future of many of the major countries involved in the war.

Coast-to-coast questioning by the institute shows that fewer than one third of nation's voters think conditions will be any better during the next year in England, France, Italy, Germany or China than they have been during the past year.

In the case of Japan, however, Americans have a more optimistic outlook. A small majority think conditions there will be greatly improved a year from now.

Americans Believe Conditions Of War-Torn Nations Will Show No Great Improvement in Year

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Since most voters do not possess first-hand information about conditions abroad, the poll reflects the impressions which the American people have formed about other nations on the basis of what is said in newspapers and magazines, and over the radio.

The way our people size up the future of other countries may have an important bearing on public attitudes here toward the Marshall Plan for Europe. Judging by the results of the poll, most Americans clearly sense Europe's vital need for help. The major question is whether they will feel that aid under the Marshall Plan will or will not substantially improve the economic status of the countries involved.

The survey questioned voters as follows:

"Do you think conditions in general will be better or worse in the coming year than they have been during the last year in the following countries?"

	Better Pct	Worse Pct	Same Pct	No opin. Pct
China	20	30	17	33
Italy	25	25	14	36
England	29	33	13	25
France	31	20	16	33
Germany	37	22	17	24
Japan	51	9	12	28

It is interesting to note that more people think the status of two countries — England and China—will be worse than better. In the case of Italy, where American observers are reporting a desperate need for aid, sentiment is about evenly divided over whether the future will be worse or better.

WAA Orders Estimate For Repair Cost In Furnace At Gadsden

Washington

• • • **War Assets Administration** is studying an estimate of Arthur McKee & Associates for repair of a Government-owned blast furnace at the Gadsden, Ala., works of Republic Steel Corp.

The Government-owned furnace has a rated annual pig iron capacity of 280,000 tons. National Housing Agency officials say their housing program calls for production of at least 55,000 tons of cast iron soil pipe per month. This goal can only be met, they believe, by capacity production at all furnaces.

Responsibility for repair of the Gadsden furnace was debated recently in Capitol Hill hearings held by the Joint Housing Committee. At a subsequent meeting attended by officials of Republic, WAA and NHA, the surplus disposal agency agreed to advance funds necessary for repair of the furnace and named the McKee firm to prepare an estimate of costs involved.

WAA officials said last week that they did not expect the furnace to resume operations before January 1. The McKee estimate, based on cost plus a fixed fee, is now being studied by WAA's Real Property Board and the Bureau of the Budget. A number of detailed questions on the repair project must be answered by WAA before the agency can enter into a definite contract with Republic for the rebuilding project, WAA spokesmen said.

Truck Registrations Up

Detroit

• • • **New truck registrations** are leading those of last year by a margin of 5 to 3 and are heading for a new all-time record, according to R. L. Polk & Co., Detroit, statisticians for the automotive industry.

New commercial car registrations for August will approximate 75,000, according to Mr. Polk.

AMERICAN IRON AND STEEL INSTITUTE
SHIPMENTS OF STEEL PRODUCTS
ALL GRADES INCLUDING ALLOY AND STAINLESS
(Net Tons)

AUGUST - 1947
Month

Steel Products	Number of companies	Items	Current Month			To Date This Year			Whole Year 1946		
			Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)	Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)	Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)
Ingots, blooms, billets, tube rounds, sheet and tin bars, etc.	41	1	308,751	5.8	152,348	* 1,939,224	4.7	* 1,426,130	1,949,624	4.0	1,645,748
Structural shapes (heavy)	13	2	371,239	7.0	26	* 2,954,335	7.1	1,964	3,474,284	7.1	5,399
Steel piling	4	3	28,005	0.5	-	* 215,802	0.5	23	205,313	0.4	141
Plates (sheared and universal)	29	4	539,817	10.2	22,223	* 4,157,630	10.0	146,350	4,152,181	8.5	250,709
Skelp	7	5	17,044	0.3	31,278	109,810	0.3	254,861	227,033	0.5	194,666
Rails—Standard (over 60 lbs.)	4	6	172,226	3.3	-	1,466,278	3.5	662	1,790,311	3.7	4,890
—All other	5	7	17,629	0.3	-	136,146	0.3	267	144,999	0.3	426
Joint bars	7	8	14,434	0.3	1,234	121,096	0.3	10,249	176,803	0.4	5,327
Tie plates	9	9	41,828	0.8	296	* 339,073	0.8	3,681	447,496	0.9	18,700
Track spikes	8	10	12,443	0.2	-	115,396	0.3	74	146,194	0.3	693
Hot Rolled Bars—Carbon	33	11	533,514	10.1	47,795	*4,193,422	10.1	501,805	5,006,859	10.3	707,991
—Reinforcing—New billet	16	12	118,510	2.2	1,046	* 838,168	2.0	6,520	1,048,483	2.1	7,381
—Rerolled	11	13	13,013	0.3	-	107,087	0.3	-	141,346	0.3	1,267
—Alloy	27	14	134,186	2.5	16,820	1,173,992	2.8	144,412	1,390,278	2.8	138,395
—Total	45	15	799,223	15.1	65,661	*6,312,669	15.2	652,737	7,586,966	15.5	855,034
Cold Finished Bars—Carbon	29	16	105,946	2.0	768	1,003,006	2.4	6,131	1,316,579	2.7	2,428
—Alloy	26	17	15,522	0.3	314	157,769	0.4	1,427	196,237	0.4	1,725
—Total	35	18	121,468	2.3	1,082	1,160,775	2.8	7,558	1,512,816	3.1	4,153
Tool steel bars	19	19	6,194	0.1	173	* 61,797	0.1	* 1,023	96,020	0.2	371
Pipe & Tubes—Butt weld	15	20	146,324	2.8	6,386	1,108,619	2.7	44,586	1,276,289	2.6	45,393
—Lap weld	8	21	36,455	0.7	22	264,740	0.6	701	305,516	0.6	238
—Electric weld	11	22	103,807	2.0	101	699,701	1.7	1,114	674,459	1.4	591
—Seamless	10	23	162,506	3.1	10,460	1,372,907	3.3	92,146	1,871,540	3.8	83,441
—Conduit	7	24	14,190	0.3	664	98,068	0.2	5,541	98,521	0.2	2,448
—Mechanical and pressure tubing	13	25	53,259	1.0	1,813	433,446	1.0	13,644	429,180	0.9	3,478
Wire rods	22	26	58,750	1.1	28,359	436,284	1.1	217,059	679,998	1.4	346,506
Wire—Drawn	39	27	208,966	4.0	15,308	*1,675,526	4.0	120,473	1,933,124	4.0	135,592
—Nails and staples	18	28	60,939	1.2	759	544,059	1.3	5,521	636,632	1.3	797
—Barbed and twisted	15	29	21,709	0.4	22	165,372	0.4	58	207,610	0.4	-
—Woven wire fence	13	30	33,290	0.6	336	270,723	0.7	2,461	383,230	0.8	-
—Bale ties	12	31	9,533	0.2	-	81,078	0.2	-	99,993	0.2	-
Black Plate—Ordinary	9	32	63,902	1.2	122	541,347	1.3	1,732	781,167	1.6	3,179
—Chemically treated	8	33	818	-	-	16,401	-	-	125,170	0.3	-
Tin and Terne Plate—Hot dipped	9	34	194,370	3.7	-	1,346,183	3.3	228	1,924,657	3.9	-
—Electrolytic	9	35	141,951	2.7	-	1,014,679	2.5	529	909,173	1.9	-
Sheets—Hot rolled	30	36	578,390	11.0	43,435	*4,736,725	11.4	387,393	5,521,463	11.3	421,198
—Cold rolled	17	37	437,494	8.3	2,991	*3,574,858	8.6	17,481	4,075,554	8.4	3,397
—Galvanized	16	38	133,711	2.5	112	*1,057,017	2.6	326	1,462,053	3.0	1,725
—Electrical and enameling	10	39	49,096	0.9	-	382,470	0.9	385	435,170	0.9	-
Strip—Hot rolled	23	40	135,294	2.6	28,565	*1,149,907	2.8	194,469	1,363,812	2.8	237,176
—Cold rolled	34	41	135,862	2.6	2,240	*1,064,815	2.6	18,794	1,282,146	2.6	25,904
Wheels (car, rolled steel)	5	42	29,986	0.6	-	241,698	0.6	2	252,308	0.5	348
Axles	5	43	17,320	0.3	-	121,114	0.3	53	130,461	0.3	221
All other	-	44	-	-	-	-	-	-	6,266	-	-
TOTAL STEEL PRODUCTS	141	45	5,278,223	100.0	416,016	* 41,487,768	100.0	*3,630,275	48,775,532	100.0	4,297,889

During 1946 the companies included above represented 99.5% of the total output of finished rolled steel products as reported to the American Iron and Steel Institute.

* Adjusted.

AMERICAN IRON AND STEEL INSTITUTE

Production of Open Hearth, Bessemer and Electric Steel Ingots and Steel for Castings

YEAR 1947

(Preliminary)

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated weekly production, all companies (Net tons)	Number of weeks in month
	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity		
January	6,544,841	95.1	384,096	87.7	284,309	65.9	7,213,246	93.0	1,628,272	4.43
February	5,830,371	93.8	314,912	79.6	276,779	71.1	6,422,062	91.7	1,605,515	4.00
March	6,614,369	96.1	378,893	86.5	314,224	72.9	7,307,486	94.3	1,649,545	4.43
1st Quarter	*18,989,581*	*95.0*	*1,077,901*	*84.8*	*875,312*	*69.9*	*20,942,794*	*93.1*	*1,628,522*	*12.86*
April	6,360,600	95.4	375,675	88.6	306,422	73.4	7,042,697	93.8	1,641,654	4.29
May	6,634,716	96.4	372,878	85.2	321,903	74.6	7,329,497	94.5	1,654,514	4.43
June	6,312,674	94.7	351,247	82.8	304,744	73.0	6,968,665	92.8	1,624,397	4.29
2nd Quarter	*19,307,990*	*95.5*	*1,099,800*	*85.5*	*933,069*	*73.7*	*21,340,859*	*93.7*	*1,640,343*	*13.01*
1st 6 Months	*38,297,571*	*95.3*	*2,177,701*	*85.2*	*1,808,381*	*71.8*	*42,283,653*	*93.4*	*1,634,467*	*25.87*
July	6,028,707	87.8	256,125	58.6	285,322	66.3	6,570,154	84.9	1,486,460	4.42
* August	6,324,456	91.9	346,033	79.0	311,597	72.2	6,982,086	90.1	1,576,092	4.43
† September	6,136,845	92.3	334,425	79.0	303,888	72.9	6,775,158	90.5	1,582,981	4.28
† *3rd Quarter*	*18,490,008*	*90.6*	*936,583*	*72.2*	*900,807*	*70.5*	*20,327,398*	*88.5*	*1,548,164*	*13.13*
† *9 Months*	*56,787,579*	*93.7*	*3,114,284*	*80.8*	*2,709,188*	*71.4*	*62,611,051*	*91.7*	*1,605,412*	*39.00*
October										4.43
November										4.29
December										4.42
4th Quarter										*13.14*
2nd 6 months										*26.27*
Total										52.14

Note—The percentages of capacity operated are calculated on weekly capacities of 1,553,721 net tons open hearth, 98,849 net tons Bessemer and 97,358 net tons electric ingots and steel for castings, total 1,749,928 net tons; based on annual capacities as of January 1, 1947 as follows: Open hearth 81,010,990 net tons, Bessemer 5,154,000 net tons, Electric 5,076,240 net tons, total 91,241,230 net tons.

* Revised
† Preliminary figures, subject to revision.

YEAR 1946

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		*Calculated weekly production, all companies (Net tons)	Number of weeks in month
	*Net tons	Percent of capacity	Net tons	Percent of capacity	*Net tons	*Percent of capacity	*Net tons	Percent of capacity		
January	3,530,192	51.1	207,512	47.4	135,183	28.9	3,872,887	49.6	874,241	4.43
February	1,301,719	20.9	25,905	6.6	65,058	15.4	1,392,682	19.8	348,171	4.00
March	5,950,241	86.2	363,949	83.1	194,574	41.6	6,508,764	83.3	1,469,247	4.43
1st Quarter	*10,782,152*	*53.8*	*597,366*	*47.0*	*394,815*	*29.1*	*11,774,333*	*51.9*	*915,578*	*12.86*
April	5,336,317	79.8	286,088	67.5	238,790	52.8	5,861,195	77.5	1,366,246	4.29
May	3,702,184	53.6	153,409	35.0	217,027	46.4	4,072,620	52.2	919,327	4.43
June	5,148,660	77.0	251,253	59.2	225,860	49.9	5,625,773	74.4	1,311,369	4.29
2nd Quarter	*14,187,161*	*69.9*	*690,750*	*53.7*	*681,677*	*49.7*	*15,559,588*	*67.9*	*1,195,971*	*13.01*
1st 6 months	*24,969,313*	*61.9*	*1,288,116*	*50.4*	*1,076,492*	*39.4*	*27,333,921*	*59.9*	*1,056,588*	*25.87*
July	6,027,388	87.5	365,332	83.6	225,963	48.5	6,618,683	84.9	1,497,440	4.42
August	6,291,363	91.1	373,837	85.4	259,322	55.5	6,924,522	88.7	1,563,098	4.43
September	5,951,232	89.2	371,465	87.8	232,869	51.6	6,555,566	86.9	1,531,674	4.28
3rd Quarter	*18,269,983*	*89.3*	*1,110,634*	*85.6*	*718,154*	*51.8*	*20,098,771*	*86.8*	*1,530,752*	*13.13*
9 months	*43,239,296*	*71.1*	*2,398,750*	*62.2*	*1,794,646*	*43.6*	*47,432,692*	*69.0*	*1,216.223*	*39.00*
October	6,312,604	91.4	387,933	88.6	251,205	53.8	6,951,742	89.0	1,569,242	4.43
November	5,873,264	87.8	318,350	75.1	266,157	58.8	6,457,771	85.4	1,505,308	4.29
December	5,286,799	76.7	222,704	51.0	250,998	53.8	5,760,501	73.9	1,303,281	4.42
4th Quarter	*17,472,667*	*85.3*	*928,987*	*71.5*	*768,360*	*55.4*	*19,170,014*	*82.8*	*1,458,905*	*13.14*
2nd 6 months	*35,742,650*	*87.3*	*2,039,621*	*78.5*	*1,486,514*	*53.6*	*39,268,785*	*84.8*	*1,494,815*	*26.27*
Total	60,711,963	74.7	3,327,737	64.6	2,563,006	46.6	66,602,706	72.5	1,277,382	52.14

Note—The percentages of capacity operated are calculated on weekly capacities of 1,558,041 net tons open hearth, 98,849 net tons Bessemer and 105,491 net tons electric ingots and steel for castings, total 1,762,381 net tons; based on annual capacities as of January 1, 1946 as follows: Open hearth 81,236,250 net tons, Bessemer 5,154,000 net tons, Electric 5,500,290 net tons, total 91,890,540 net tons.

* Revised January through December, 1946.

Industrial Briefs . . .

- MORE GLYCOLS—Large scale production of new synthetic organic chemicals by Wyandotte Chemicals Corp., Wyandotte, Mich., has begun. The plant will produce glycols used in automobile antifreeze preparations and in making dynamite.

- APPOINTS DIRECTOR — Hubert E. Snyder has been appointed managing director of the Toncan Culvert Manufacturers Assn., Cleveland. Toncan iron is a product of Republic Steel Corp. Mr. Snyder succeeds P. H. Pickering who has resigned.

- NASH ADDS PLASTICS—Nash-Kelvinator Corp. has established a Milwaukee plastic division in a converted warehouse at 3200 S. Clement Ave., near the firm's parts and service department. W. F. Poupard will supervise the Milwaukee operations.

- FUEL SYSTEMS LAB—Construction of a $120,000 laboratory on a newly acquired 35-acre site in Bedford Township, near Cleveland, will be started by the Pesco Products Div. of Borg-Warner Corp. The laboratory will be used for the testing of aircraft fuel systems, and will also do further research in hydraulics as applied to general industrial use.

- OVENS REPLACEMENT — Dominion Steel & Coal Corp., plans expenditures of $4 million for the replacement of coke ovens at Sydney, N. S.

- STRIP MILL CONTRACTS—Detroit Steel Corp., Detroit, has announced the letting of contracts for the immediate construction of a cold-rolled strip mill to be located at New Haven, Conn.

- BEGINS CONSTRUCTION—H. M. Harper Co., Chicago, manufacturer of nuts and bolts, has announced the breaking of ground for their new offices and manufacturing plant at Morton Grove, Ill.

- HAPPY BIRTHDAY — Wallingford Steel Co., Wallingford, Conn., a subsidiary of Allegheny Ludlum Steel Corp., has commemorized 25 years of manufacturing with a plant inspection and banquet.

- NEW DIVISION — Acme Steel Co., Chicago, has purchased the Hoffert Machine Co., the Printers Supply Co. and the Ajax Tool & Die Co. and will operate them as the Hoffert Div. of Acme Steel Co., Racine, Wis.

- PLANS CHICAGO PLANT — Manufacturing operations of the Westinghouse Electric Corp. in Chicago will soon be enlarged. A site has been acquired and immediate construction of a plant is planned.

- ACME OPEN HOUSE—Approximately 30,000 guests toured the Acme Steel Co., Chicago, during a recent open house. Visitors were shown both the hot and cold mills.

- ACQUIRES DIE PLANT—Harvill Corp. has announced acquisition of a third die casting plant at 4358 Roosevelt Rd., Chicago. Operations will be conducted by a wholly owned subsidiary, the Harvill Mid-West Corp.

- WEST COAST OFFICE—Tournalayer Sales Div. of R. G. LeTourneau, Inc., Peoria, Ill., has announced the opening of a division office at 5007 E. Washington Blvd., Los Angeles.

- RAYON PLANT PROGRESSING—Two buildings of the American Enka Corp.'s $25 million rayon plant at Morristown, Tenn., have been completed and steel erection has started on three others.

- NAMED TO FACULTY — Max Hansen, German scientist, has been appointed associate professor of metallurgical engineering at Illinois Institute of Technology.

J. L. Trecker Dies Suddenly at Office

Milwaukee

• • • **Joseph L. Trecker,** 45, president of the Kearney & Trecker Corp., builders of precision and production machine tools for milling and boring, collapsed and died of a heart attack at his desk Tuesday, Oct. 7.

J. L. Trecker

Mr. Trecker joined the company, founded in 1898 by his father, Theodore, and Mr. E. J. Kearney, in 1925 soon after he left college. He was widely known in industry throughout the country and was an officer and director of the National Machine Tool Builders' Assn.

During the war he served in various capacities in the national defense program at Washington. When the industry was completely geared to the war effort, Mr. Trecker returned to his own business but continued on call as adviser to the then Undersecretary of War, R. A. Patterson.

Because of his knowledge of the machine tool business, he has been recognized as a spokesman for the industry in this country. Just recently Mr. Trecker was named a member of the Machine Tool Committee of the Army and Navy Munitions Board.

AGMA to Hold Meeting Oct. 27-29 at Chicago

New York

• • • **The American Gear Manufacturers Assn.** will hold its semiannual meeting from Oct. 27 through Oct. 29, at the Edgewater Beach Hotel, Chicago. In addition to the regular committee meetings, there will be two papers presented, "Cone-Drive," by F. E. Birtch, manager of the Cone-Drive Div., Michigan Tool Co., Detroit, and "Gears—Their Application, Design, and Manufacture," by L. J. Collins, research engineer of General Electric Co., Schenectady. The semiannual dinner will be held Tuesday evening, Oct. 28, in the ballroom of the Edgewater Beach Hotel.

Industry to Spend Less On Plant and Equipment

Washington

• • • **Industry will spend** $4,020,000,000 on new plants and equipment in the fourth quarter of 1947, the Securities and Exchange Commission and Commerce Dept. estimated last week. The estimated figure is about $50,000,000 less than planned expenditures during the third quarter.

Manufacturing industries probably will spend about $1,820,000,000—about $20,000,000 less than in the third quarter—the two agencies estimated in a joint quarterly report. The decrease will continue a slight downward curve began in the third quarter.

Of the estimated total expenditure for 1947 of $15,180,000,000 by all types of business, manufacturing industries probably will expend $6,960,000,000, according to the report. Mining industries will wind up the year outlays of $650,000,000, while railroads will have spent some $1,040,000,000. Other estimates are: Transportation other than railroad, $880,000,000; electric and gas utilities, $1,790,000,000, and commercial and miscellaneous, $3,870,000,000. Agricultural expenditures are not taken into account in any of the estimates.

The agencies' report is based on data contained in SEC registrations and on samples of unregistered manufacturing companies' figures.

Additional Quotas For Fourth Quarter Export

Washington

• • • **Additional fourth** quarter export quotas announced by the Office of International Trade are as follows:

Commodity	Fourth Quarter 1947 Quota
Metallurgical coke (include coal-tar coke)	15,000 GT
Metal window frames, window sash, fabricated door frames	$840,000
Floor drains, cast iron; and the following iron and steel pipe fittings when 150 lb pressure and under; couplings; galvanized pipe fittings, malleable iron pipe fittings; pipe joints, gray iron, extension; pipe nipples, lap-welded, black; pipe plugs; pipe unions; screw elbows; swage nipples	5,000 NT
Cast-iron soil pipe, pipe fittings	1,800 NT
Woven-wire, screen cloth, of all metals and alloys: Insect	5,500,000 sq ft
Refined copper, bus bars only.	50 NT
Old and scrap copper........	1,000 NT
Copper pipes and tubes......	2,500 NT
Copper plates, sheets, and strips	2,500 NT
Copper rods	200 NT
Copper wire, bare............	3,000[1] NT
Rubber covered wire, except lamp cord	2,000 NT
Weatherproof wire	1,000 NT
Other insulated copper wire..	5,000[2]
Brass and bronze, scrap and old	10,000[3]
Brass and bronze ingots......	5,000[4]
Brass and bronze bars, rods and unfinished shafting.....	7,500 NT
Brass and bronze blanks, plates, sheets, and strips, and bronze circles..........	5,000 NT
Brass and bronze pipes and tubes (include pipe coils)...	3,000 NT
Brass and bronze pipe fittings.	500 NT
Brass and bronze wire, bare and insulated	3,000 NT
Bronze structural shapes, brass and bronze castings and forgings	400 NT
Lead pigs and bars (include blocks and ingots)..........	500 NT
Lead sheets and pipes (include bends)	500 NT
Lead solder	130[5] NT
Type metal (antimonial lead).	1,000 NT
Lead foil and lead-tin........	50 NT
Lead plate, or battery plate, not assembled as complete battery units	3,000 NT
Lead scrap and residues......	1,000 NT
Lead castings; caulking yarn; circles; discs; flanges; plugs; powder; rings; metal packing rings; roof flanges; sash weights; scale-weights; shots; shrapnel; sinkers; strips; tape; washers; weights; wire; wool........	200 NT
Collapsible tubes	4[6] NT
Tin metal in ingots, pigs, bars, blocks, slabs and other forms	15 NT
Zinc cast in slabs, pigs, or blocks	5,000 NT
Babbitt metal	300[7]
Antimony	250 NT
Cadmium metals (include metallic shapes)	100 NT
Copper alloys in primary forms, except brass, bronze, nickel, or gold..............	500 NT
Type (include multigraph type)	200 NT
Rigid metal conduit..........	$2,650,000

Notes:

(1) Not over 250 tons in copper clad and copper weld wire.

(2) No more than 750 tons shall consist of magnet wire.

(3) Tin content not to exceed 5 pct.

(4) Not more than 5 pct of quota shall contain more than 5 pct tin.

(5) Tin content not to exceed 40 tons.

(6) Licenses will be issued against this quota only for collapsible tubes to be used for certain medicinal and pharmaceutical purposes in accordance with order M-43, schedule 1, par. 2, listings 1 and 2.

(7) Tin content not to exceed 108 tons.

50 YEARS AGO

THE IRON AGE, *October 14, 1897*

• "The belief is prevalent, being founded on observations of more than a few persons, that the tactics of the Standard Oil Co. may be repeated in the iron trade. Unlimited capital and the shrewdest management are yoked in this new development of constructive enterprise and those who are in its way must be absorbed or crushed. Great as the Carnegie-Oliver-Rockefeller interests are now, overshadowing any other group of iron interests in the country, they are evidently considerably under what their astute managers hope eventually to make them."

• **"The rush for steel has been overflowing to the puddle mills, making forge iron scarce and causing activity in muck bars."**

• "The important features of the new double-turret automatic screw machine designed and built by the Spencer Automatic Machine Screw Co. of Windsor, Conn., are a primary spindle and a secondary spindle working in combination with a double turret. The primary spindle carries the revolving rod which is operated upon by tools in the detached piece, upon which further operations are performed by tools in the rear turret."

• **"The chainless bicycle has finally made a definite appearance in the U.S. One large concern, E. C. Stearns & Co., have announced that they will make and sell a bevel-geared chainless wheel in their line for 1898."**

• "Due to the growth of Western trade, the Singer Mfg. Co., Elizabeth, N. J., has purchased the plant of the Economist Plow Co. at South Bend and will convert it for the manufacture of sewing machines. The equipment will be thoroughly modern and every machine will be run by electric power."

Construction Steel . . .

• • • **Fabricated steel awards** this week included the following:

8175 **Tons,** Chicago, Midland power station for Commonwealth Edison to American Bridge Co., Pittsburgh. Erroneously reported in the Oct. 2 issue as going to Carnegie-Illinois Steel Corp.

2650 **Tons,** Long Beach, Calif., transit shed, Outer Harbor, to Pacific Iron & Steel Co., Los Angeles.

900 **Tons,** Portland, Me., supermarket for First National Stores to Bethlehem Steel Co., Bethlehem.

700 **Tons,** diesel shop for Chicago & Northwestern R. R. to Bethlehem Steel Co., Bethlehem.

500 **Tons,** Champagne, Ill., grain elevator for Swift & Co. to Inland Steel Co., Chicago.

290 **Tons,** Philadelphia, General Motors Corp., warehouse, to Bethlehem Steel Co., Bethlehem.

265 **Tons,** Los Angeles, sound stage for Paramount Pictures, to Bethlehem Pacific Coast Steel Corp., San Francisco.

220 **Tons,** East Chicago, Ind., lab and change house for Cities Service Co. to Wendnagle & Sons.

195 **Tons,** Los Angeles, Los Angeles Soap Co. building, through Schuck Construction Co. to Consolidated Steel Corp., Los Angeles.

• • • **Fabricated steel inquiries** this week included the following:

1500 **Tons,** Philadelphia, hangars, S.W. airport, City of Philadelphia, Hughes-Foulkrod Co., low bidders.

1500 **Tons,** Los Angeles, Graybar Electric Co. transmission towers.

1100 **Tons,** San Diego, San Diego baseball club grandstand.

1040 **Tons,** Manitowoc County, Wis., State Highway Dept. No. S-0740-1, bids close Oct. 21.

640 **Tons,** Santa Clara, Calif., Owens-Corning Fibreglas Corp. warehouse, Bechtel Corp., San Francisco, general contractor.

465 **Tons,** Pomona, Calif., Los Angeles County fair building.

450 **Tons,** Los Angeles, Haas-Baruch warehouse.

355 **Tons,** Marquette County, Wis., State Highway Dept. No. FAS 02-3, bids close Oct. 21.

300 **Tons,** Riverside County, Calif., Imperial Valley Irrigation, Coachella district, crossarms and trellis for power.

250 **Tons,** Secaucus County, N. J., bridge, New Jersey Dept. of Highways, bids in.

180 **Tons,** Philadelphia, 70th St. bridge, City of Philadelphia, for rebidding Oct. 26.

165 **Tons,** Rock County, Wis., V-030-2-19, State Highway Dept., bids close Oct. 21.

145 **Tons,** Brown County, Wis., State Highway Dept., FAP 020-3-11, bids close Oct. 21.

140 **Tons,** Jefferson County, Wis., State Highway Dept. FAS 0442-1, bids close Oct. 21.

110 **Tons,** San Luis Obispo County, Calif., highway construction between Miles Station and Marsh St., California Div. of Highways, bids to Oct. 29.

100 **Tons,** Tremipealeau County, Wis., State Highway Dept. No. S-0601-S, bids close Oct. 21.

• • • **Reinforcing bar awards** this week included the following:

850 **Tons,** Ironville, Ohio, cleaning house and storage silos for the National Milling Co. to Carnegie Illinois Steel Corp., Pittsburgh.

600 **Tons,** Minneapolis, Aero building for University of Minnesota, Hagstrom Construction Co., Minneapolis, low bidder.

270 **Tons,** Champagne, Ill., national resources building, University of Illinois, Kuehne-Simmons, Rantoul, Ill., low bidder.

250 **Tons,** Chicago, diesel shop for Chicago and Northwestern R.R. through S. M. Nielsen, previously reported low bidder, to Bethlehem Steel Co.

• • • **Reinforcing bar inquiries** this week included the following:

1600 **Tons,** Philadelphia, Penrose Ave. bridge substructure, bids in.

135 **Tons,** Central Valley Project, Calif., construction of transmission lines, Bureau of Reclamation, Denver, Spec. 1967, bids to Oct. 24.

130 **Tons,** San Luis Obispo County, Calif., highway construction between Miles Station and Marsh St., California Div. of Highways, bids to Oct. 29.

• • • **Plate awards** this week included the following:

2575 **Tons,** St. Paul, 65 propane tanks for the United Petroleum Gas Co. to Chicago Bridge & Iron Co., Chicago.

• • • **Piling awards** this week included the following:

420 **Tons,** bearing piles through Fitzsimmons & Connell Dredge & Dock Co. to Carnegie Illinois Steel Corp., Pittsburgh.

Coming Events

Oct. 18-24 **National Metal Exposition, Chicago.**

Oct. 20-21 **Society of Automotive Engineers,** production meeting, Cleveland.

Oct. 20-22 **Iron and Steel and Institute of Metals Divisions of AIME,** annual fall meeting, Chicago.

Oct. 20-22 **National Foreign Trade Convention,** St. Louis.

Oct. 20-24 **American Society for Metals,** annual meeting, Chicago.

Oct. 20-24 **American Welding Society,** annual meeting, Chicago.

Oct. 20-24 **American Industrial Radium and X-Ray Society,** annual meeting, Chicago.

Oct. 30-Nov. 1 **American Society of Tool Engineers,** semiannual meeting, Boston.

Oct. 31 **Illinois Mining Institute,** annual meeting, Springfield, Ill.

Nov. 2-5 **National Tool and Die Manufacturers Assn.,** annual meeting, Philadelphia.

Nov. 6-7 **National Founders Assn.,** annual meeting, New York.

Nov. 6-7 **Society of Automotive Engineers,** fuels and lubricants meeting, Tulsa, Okla.

Nov. 7-8 **Annual Conference on X-Ray and Electron Diffraction,** Mellon Institute of Industrial Research, Pittsburgh.

Dec. 1-3 **Society of Automotive Engineers,** air transport meeting, Kansas City.

Dec. 1-6 **Twenty-First Exposition of Chemical Industries,** New York.

Grants 8.9 Pct Overall Freight Rate Increase

Washington

• • • **An overall** interim freight rate increase of 8.9 pct has been granted rail carriers by the ICC, thereby granting virtually everything asked by the carriers at the beginning of the hearings on Sept. 9. The increase approved is, in general, 10 pct for all commodities except iron ore, coke and coal.

For iron ore, an increase of 10¢ a net or gross ton is allowed.

On line haul rates for coke and coal (including lignite), the permitted increase is 10¢ per net ton or 11¢ per gross ton. No changes are allowed in protective charges.

The revised rates went into effect Monday, October 13, the roads having filed the required three-day public notices on October 10.

The Commission said that the increase granted Oct. 7 was made to partially offset recent wage increases to nonoperating employees and other rising costs.

Action is still pending on the general rate increase which the Commission estimates would bring increases since the war to 38 pct in the eastern district and 28 pct elsewhere.

Rise to New Positions

Washington

• • • **Two Interior Dept.** officials, Arthur Goldschmidt and Walton Seymour, have been elevated to new positions within the department, Secretary Krug announced last week.

Mr. Goldschmidt, formerly director of the Power Div., now serves as executive vice-chairman of the Interdepartmental Technical Committee. The committee will plan the International Scientific Conference on the Conservation and Utilization of Natural Resources.

"WHAT'S THE TOUGHEST IRON NOTCH?"

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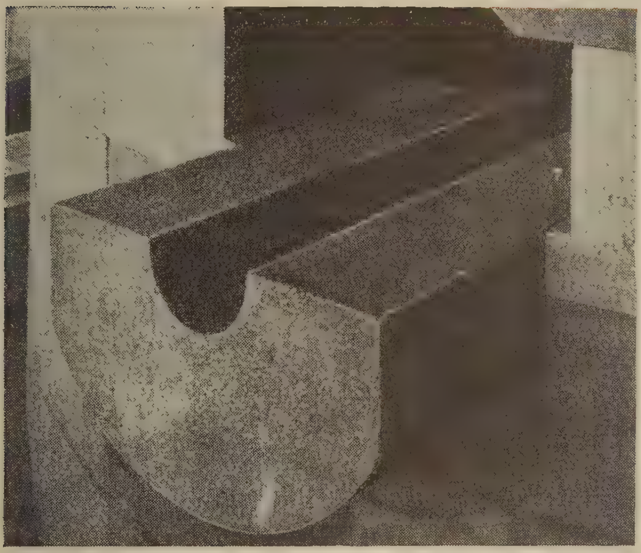

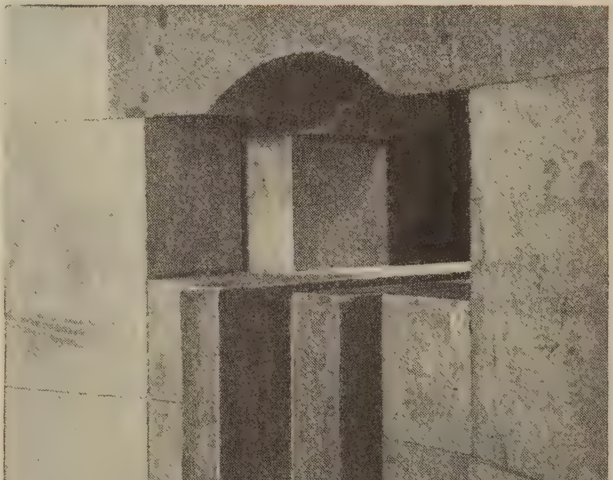

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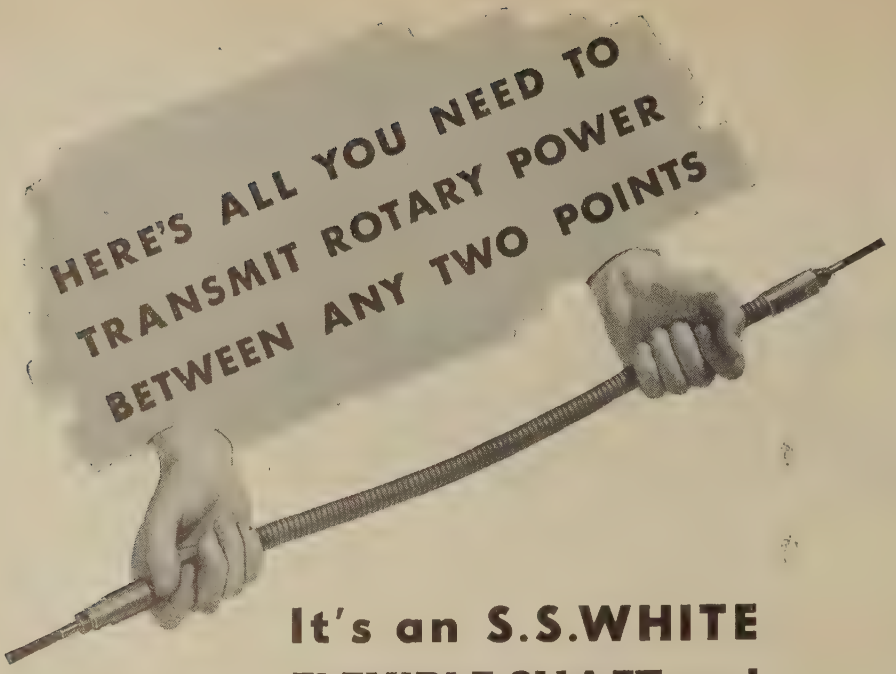

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Accuses Reuther Of Deceit and Abusing Executive Privileges

Detroit

• • • **Internal bickering** and name-calling in the UAW-CIO reached a regrettable new high recently when the Addes-Thomas-Leonard faction openly accused Reuther, UAW-CIO president, of falsehoods. By a vote of 14 to 8, the anti-Reuther group passed a resolution accusing Reuther of having abused his executive privileges and deceiving his fellow officers by publishing in the September issue of the United Auto Worker, union paper, a leaflet entitled "Report to the Membership."

The board also voted that in the future any communication by Reuther to UAW-CIO members must be approved by George F. Addes, secretary-treasurer, who spearheads the anti-Reuther block.

The Reuther report specifically charged that more than $500,000 in union funds have been wasted in union organizing drives, that political patronage is rampant in the union and that the board has consistently refused to enforce a union provision against Communists holding office.

The UAW convention opens Nov. 9 in Atlantic City and all union offices will be at stake. Therefore, Detroit has learned to expect UAW-CIO political fireworks about this time of the year. Holding a majority of the 22-man board, the Addes-Thomas-Leonard faction has promised to reply to Reuther's recent sensational charges in the October issue of the Auto Worker which is distributed among the 900,000 members of the union. In addition, the anti-Reuther faction has restricted Reuther's activity by revising the method for selection of committees at the November convention. Under a new plan, the union president's power of appointment has been drastically curtailed.

Most sources here agree that if Reuther wins at Atlantic City it will be because he has rank and file support and not because his board has not done everything possible to strip him of office.

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CAUSTIC ASH

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(Precipitated Calcium Carbonate)

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(Hydrated Calcium Silicate)

*SODA BRIQUETTES
(Iron Desulphurizer)

SODIUM BICARBONATE

CALCIUM CHLORIDE

*PITTCHLOR
(Calcium Hypochlorite)

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* If you want to keep your shop looking clean, start from the floor up. Use Wyandotte Zorball, the *all-purpose* floor absorbent, to remove oil, grease and other liquids quickly and efficiently.

Zorball gives an immediate anti-skid surface to soiled floors, thus reducing the danger of slipping accidents. And it is nonflammable. Even when soaked with oil, it will not readily support combustion.

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United Engineering & Foundry Co. Sponsors Reserve Service Uni

Pittsburgh

• • • **The War Dept.** has calle upon industry to play a major par in the present plans for creatio of a large pool of reserve servic units, ready for immediate mobilization should this nation agai suddenly find itself at war. Unde a plan known as the War Dept. Affiliation Program, civilian organizations will "sponsor" certain ke service type units of the Organized Reserve Corps.

The Pittsburgh Ordnance district and Western Pennsylvani Military district has just announced that the United Engineering & Foundry Co., Pittsburgh, ha been approved to sponsor an Ordnance Medium Maintenance Company. They will sponsor a Class Unit, i.e., a unit with a full complement of officers and enliste men.

The purpose of these industria reserves is to provide effective operating units of an administrativ or technical nature for immediat mobilization. While holding exactly the same status as the organize reserves of which they are actually a part, they will not be calle out for active duty until the President proclaims a national emergency or Congress declares war.

This particular unit will be organized at the New Castle, Pa plant of the United Engineering Foundry Co. and while most of th personnel will be drawn from th ranks of the company's employee the sponsor may draw on outsid forces for filler personnel. Th commanding officer of the unit wi be a reserve officer equally acceptable to the sponsor and the Wa Dept. Other officer vacancies wi probably be filled from the roste of the organized reserve or th personnel of the sponsor compan

Training schedules are provided, just as for the Nationa Guard and other organized reserves. Necessary instructio clothing, and equipment will b provided by the War Dept. A meeting place and storage for equipment will be provided by the sponsor. This unit is to be trained i various types of maintenance an repair services, and in the event a sudden attack, will be assigne

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WHETHER your chucking needs call for a "jack of all trades" such as a combination chuck . . . or for a specialist like an indexing chuck . . . there's a Union chuck to do the job with rugged accuracy and cost-cutting efficiency.

Union chucks compose the broadest line of chucks in the world. Union maintains a complete engineering service to help you determine the right chucks . . . from drill to power chucks . . . for your particular purposes. Distributors in all important industrial centers.

The Union Manufacturing Company has been serving industry for 70 years.

In chuck design and manufacture, Union has continually kept ahead of industry's needs, opening the way to greater productivity of men and machines. This engineering leadership, as well as Union's widely recognized integrity of workmanship, are reflected in the complete line of chucks described and illustrated in Catalog No. 62. Write for a copy today.

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New Britain, Connecticut

as a unit together with regular Army troops to the scene.

Normally, 15 to 20 service personnel are required to support each man in actual combat service. Obviously, the peacetime regular Army and the National Guard cannot include in their peacetime setup sufficient service type units to provide necessary support in event of sudden mobilization. These units are extremely important to provide necessary support for the basic combat elements of the Army of the United States.

Real Estate Brokers May Get Break in The WAA Surplus Disposals

Washington

• • • **Use of real** estate brokers to assist in disposal of its war plants and other real property is under serious consideration by WAA which not only has a declared surplus of $3.5 billion worth remaining to be sold but is faced with a sagging market. Commissions similar to those allowed machine tool dealers would be paid should the plan be approved.

In the meantime, another shuffling of procedure has been completed by which it is hoped to speed up sales and complete war plant disposals by the end of the current fiscal year.

Principal features of the newest WAA plan include decentralization of authority, sales by direct negotiation, needling of the field sales force, and a projected setting up of zone advisory councils.

Field offices are to be given direct responsibility to sell although Washington will continue to set the prices. The practice of formally advertising of properties will be discontinued in cases of scrambled facilities and such properties where there is only one possible buyer. In such cases, sales will be made by direct negotiation.

It is proposed to set up zone advisory councils which will be composed of qualified industrialists and professional men. They will be consulted as to fair values, methods of best handling WAA white elephants, and even to assist in making direct negotiations with potential buyers.

NEW NMO "PLUG-IN" PANELBOARD WITH THERMAL-COILLESS MAGNETIC MULTI-BREAKERS

• This new NMO "Plug-in" Panelboard greatly improves the utilization of space on walls and columns because of its minimum overall size. Yet it has more gutter space (5½" gutters in 15" wide panelboard) due to the small size of MO4 Multi-breaker units. The narrow, column type has twice the usual number of circuits ever before available in cabinets of similar height.

The high-speed, *coilless* magnetic and thermal trip of the MO4 breaker unit used in the NMO Panelboard, gives adequate time lag for starting motors and tungsten lamp inrush currents. It trips as fast as one-hundredth of a second at current values slightly above operating range.

and consider these PLUS FEATURES at no additional cost to you . . .

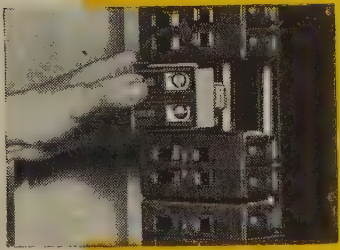
- Low heating, which permits small size, is achieved by exceptionally high silver content in the contacts, and the elimination of bolted current-carrying connections at the silver-surfaced buss bars through the use of the effective Square D positive-pressure contact jaws.
- The "Plug-in" feature permits easy removal and insertion of units for future changes in circuit ratings or additional circuits if space is originally provided.
- The breaker units regularly provide four single poles which can be readily converted into two double poles by the insertion of handle ties, either in the field or at the factory, if specified when panelboard is ordered.

NMO Panelboards are furnished in 100 and 200 ampere mains ratings, 120/240 volt A. C. with 15, 20 and 30 ampere branch circuits.

A BULLETIN giving complete information on the NMO "Plug-in" Panelboard is being sent to everyone on the Square D mailing list. WATCH FOR IT! ... If you do not receive your copy write Square D Company, 6060 Rivard Street, Detroit 11, Michigan.

CIRCUITS EASILY INSTALLED OR CHANGED

SWING OUT.......



OR LIFT OUT........

ATTACH WIRES........

"PLUG-IN"

SQUARE D COMPANY

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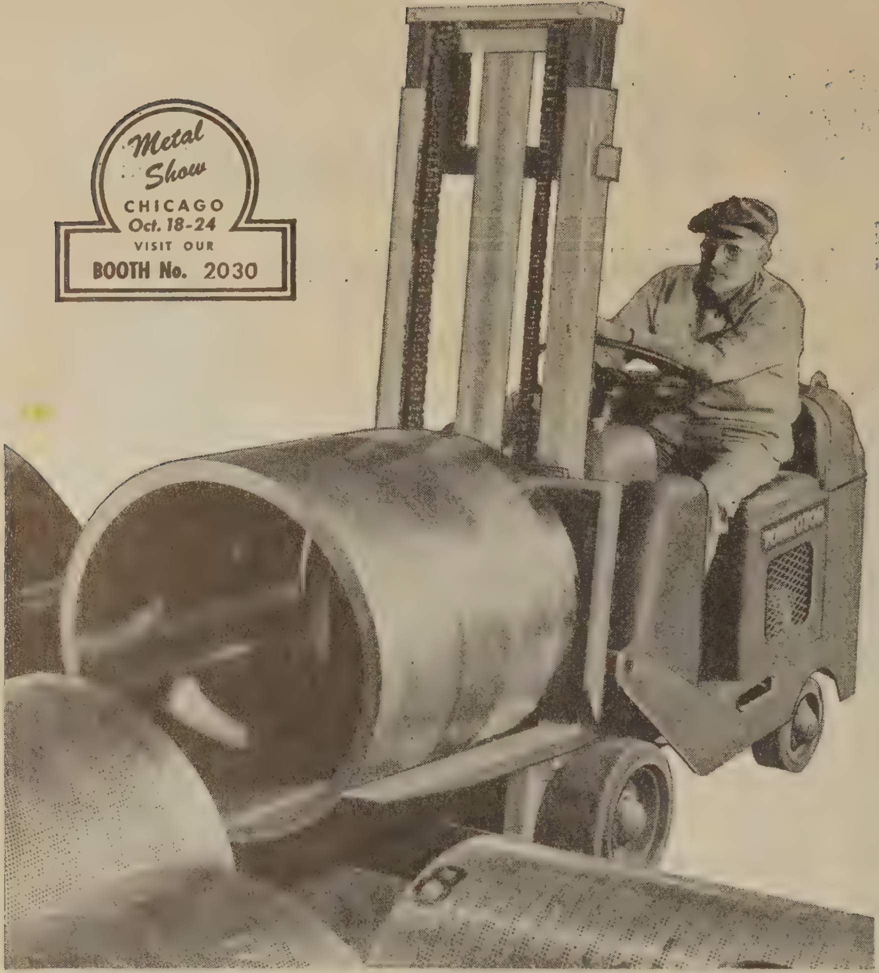

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TUNE UP your production machine for the competitive race, and let Towmotor Fork Lift Trucks and Accessories provide the added horsepower that will keep you out in front. With Towmotor maintaining a scheduled flow of materials between every phase of operation, your production machine will function smoothly and swiftly . . . you'll get maximum output at minimum cost. There's a Pocket Catalog that lists the complete line of Towmotor Fork Lift Trucks and Accessories . . . send for your copy today. Towmotor Corporation, Division 15, 1226 East 152nd Street, Cleveland 10, Ohio.

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THE ONE-MAN-GANG
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Makes Progress In Developing Materials For the Gas Turbine

Schenectady

• • • **Great strides** have been made in the development of suitable materials for gas turbine service within a comparatively limited time, E. M. Phillips, of the General Electric Co.'s Aircraft Gas Turbine Div. at Lynn, told delegates attending the recent SAE National Aeronautics meeting in Los Angeles.

In presenting a paper entitled, "The Metallurgical Aspects of Gas Turbine Wheels and Nozzles," Mr. Phillips pointed out that development of materials capable of operating at high temperatures was necessary for the successful development of the gas turbine.

Selection of promising materials has been based on creep and rupture test results, he added, declaring that development of materials in use requires knowledge of all properties of each material and extensive laboratory testing, including behavior under vibration or stress or temperature variation, heat shock, notch sensitivity, corrosion and corrosion by hot gases, ductility and stability.

One difficulty which required a vast amount of testing to destruction, Mr. Phillips said, was obtaining satisfactory large forgings of austenitic materials. This problem was best solved by the development of the so-called "composite" wheel.

This consists of a central or hub and disk portion of ferritic low temperature steel and an outer or rim portion of high temperature austenitic material solidly bonded together by a suitably controlled weld, using austenitic weld rod. This design has an additional advantage, he declared, in that the hub forging can include the shaft extension, thus eliminating the necessity of welding on a shaft extension.

Mr. Phillips said also that despite the fact that much progress already has been made, extensive additional data are needed to develop new materials and to understand the laws governing high temperature material performance. A great deal must be done too, he added, to develop controls needed to ensure that materials always will possess the most desirable properties.

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of a
Series
of Typical
Installations

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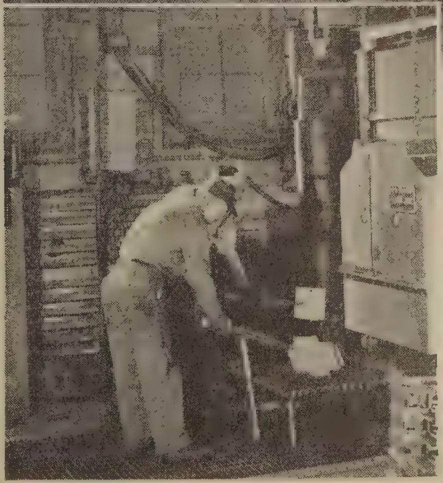
STEWART
THE BEST INDUSTRIAL FURNACES MADE

For FABRICATING and HEAT TREATING MANGANESE ALLOY STEELS

AT MANGANESE STEEL FORGE CORPORATION, PHILADELPHIA, PA.

Charging the Sunbeam Stewart Dual Purpose Continuous Conveyor-type Heat Treating and Heating Furnace. Manganese Corporation operates this oil-fired unit at a capacity of 1200 lbs. of work per hour at 1830° to 1900° F. Heating chamber is 3′ x 12′ x 8″.



Removing work from high heat zone prior to forming in hydraulic presses from the Sunbeam Stewart Dual Purpose Furnace. Location of quench tank beneath floor permits easy access to the discharge table.

Close temperature control and an even heat distribution (plus or minus 5° at 1900° F.) were specifications necessary to accurately heat treat high manganese alloy steels at Manganese Corporation. Sunbeam Stewart engineers met these requirements by designing a *dual purpose* Continuous Conveyor-type Heat Treating and Heating Furnace.

A hinged alloy plate, operated by a manual control, allows work to drop off the conveyor into a water quench. This gives Manganese an instantaneous quench without loss of temperature and without leaving the furnace's protective atmosphere.

When heating for forming, the plate is moved toward the conveyor belt. Work then drops down a straight line chute to a receiving table. Thus the alloy can be fabricated by hot-working.

This completely automatic installation is typical of the industrial furnaces Sunbeam Stewart is building every day to meet specific production requirements. In addition, Sunbeam Stewart builds a full line of standard furnaces.

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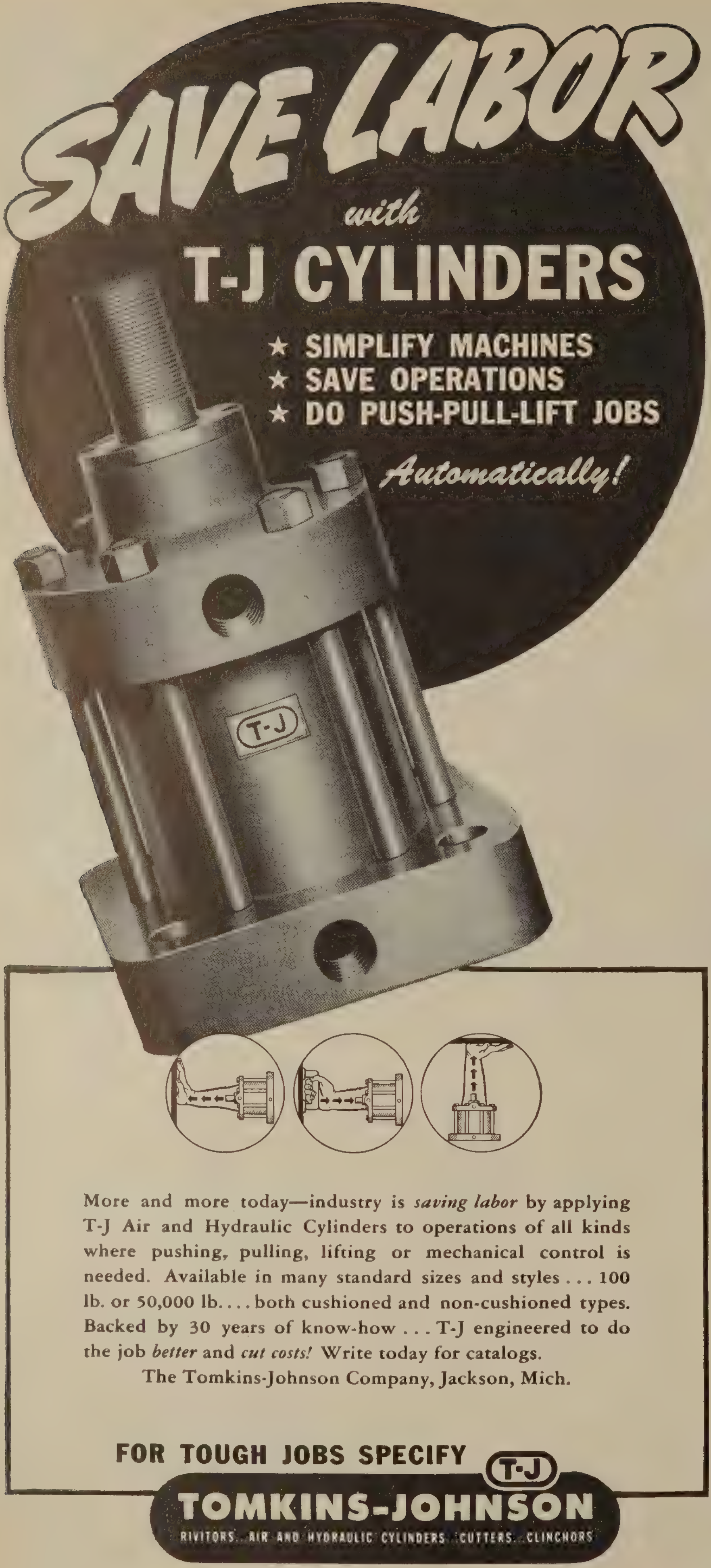
A letter, wire or 'phone call will promptly bring you information and details on SUNBEAM STEWART furnaces, either units for which plans are now ready or units especially designed to meet your needs. Or, if you prefer, a SUNBEAM STEWART engineer will be glad to call and discuss your heat treating problems with you.



More and more today—industry is *saving labor* by applying T-J Air and Hydraulic Cylinders to operations of all kinds where pushing, pulling, lifting or mechanical control is needed. Available in many standard sizes and styles . . . 100 lb. or 50,000 lb. . . . both cushioned and non-cushioned types. Backed by 30 years of know-how . . . T-J engineered to do the job *better* and *cut costs!* Write today for catalogs.

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FOR TOUGH JOBS SPECIFY T-J

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RIVITORS . . AIR AND HYDRAULIC CYLINDERS . . CUTTERS . . CLINCHORS

Named Vice-Chairman Of AFA Gray Iron Div.

Chicago

• • • **V. A. Crosby**, metallurgical engineer in charge of sales, service and development for Climax Molybdenum Co., Detroit, has been chosen vice-chairman of the gray iron division of American Foundrymen's Assn., according to AFA technical director S. C. Massari.

V. A. Crosby

Elected by unanimous vote of the gray iron executive committee to succeed R. G. McElwee, who recently assumed the chairmanship, Mr. Crosby will also head the division program and papers group, which will organize the technical sessions to be sponsored at AFA's convention and foundry show in Philadelphia next May 3-7.

A past chairman of the AFA Detroit chapter, Mr. Crosby has also served on many technical committees of the international society of the castings industry.

Associated with Climax Molybdenum since 1934, he had previously been foundry metallurgist with Studebaker Corp. at South Bend and, earlier, chief metallurgist for Packard Motor Car Co., Detroit.

To Vote on Stock Bonuses

Detroit

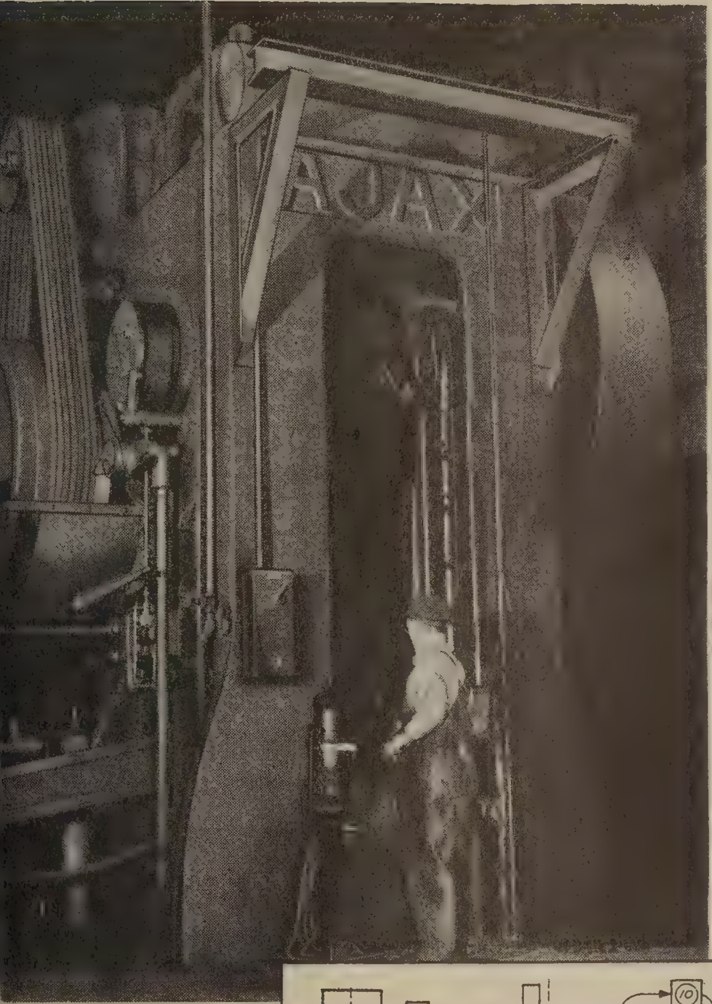
• • • **Stockholders of** Gerity-Michigan Die Casting Co., Adrian, Mich., will vote upon a proposed stock bonus plan for the salaried officers and employees receiving compensation in excess of $3000 per year. Under the plan 10 pct of the net profits of the company before taxes but not to exceed 15 pct of the total compensation paid to the eligible employees during the fiscal year will be paid either in stock or cash over a period of 5 years.

Approximately 121 employees of the company are eligible to participate in the plan.

Stockholders of the company will also vote on changing the name of the corporation to Gerity-Michigan Corp.

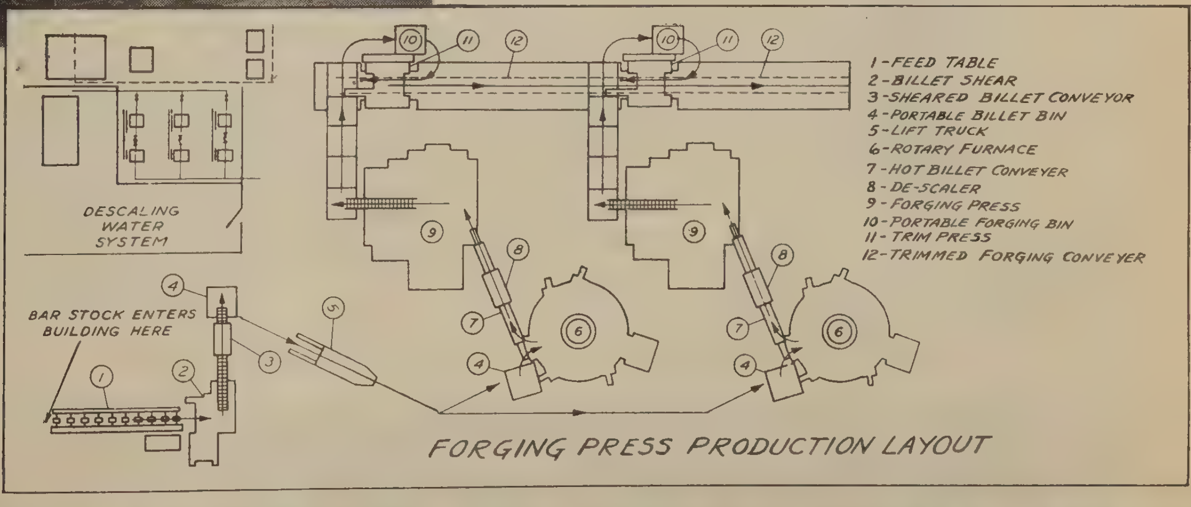
AJAX PRESS FORGING DEPENDABILITY

the key to Production Line Forging



● The uninterrupted high speed forging production of the AJAX PRESS makes it practical and most profitable to operate a completely conveyorized plant with rotary or pusher type furnace, de-scaler, forging press and trim press in continuous line operation. The diagram below shows the layout of a forge shop in which two AJAX HIGH SPEED PRESSES (see No. 9 in diagram) are properly located for their important part in line production of high quality forgings at a high rate of production. Built on the basis of mechanical soundness, to require a minimum of down-time for die change or maintenance, and built to provide sustained high speed operation, the AJAX PRESS has that dependability we refer to as the key to successful production line forging.

WRITE FOR BULLETIN 75-B


DESCALING WATER SYSTEM
BAR STOCK ENTERS BUILDING HERE
1
2
3
4
5
6
7
8
9
10
11
12
1-FEED TABLE
2-BILLET SHEAR
3-SHEARED BILLET CONVEYOR
4-PORTABLE BILLET BIN
5-LIFT TRUCK
6-ROTARY FURNACE
7-HOT BILLET CONVEYER
8-DE-SCALER
9-FORGING PRESS
10-PORTABLE FORGING BIN
11-TRIM PRESS
12-TRIMMED FORGING CONVEYER

FORGING PRESS PRODUCTION LAYOUT

THE AJAX MANUFACTURING COMPANY

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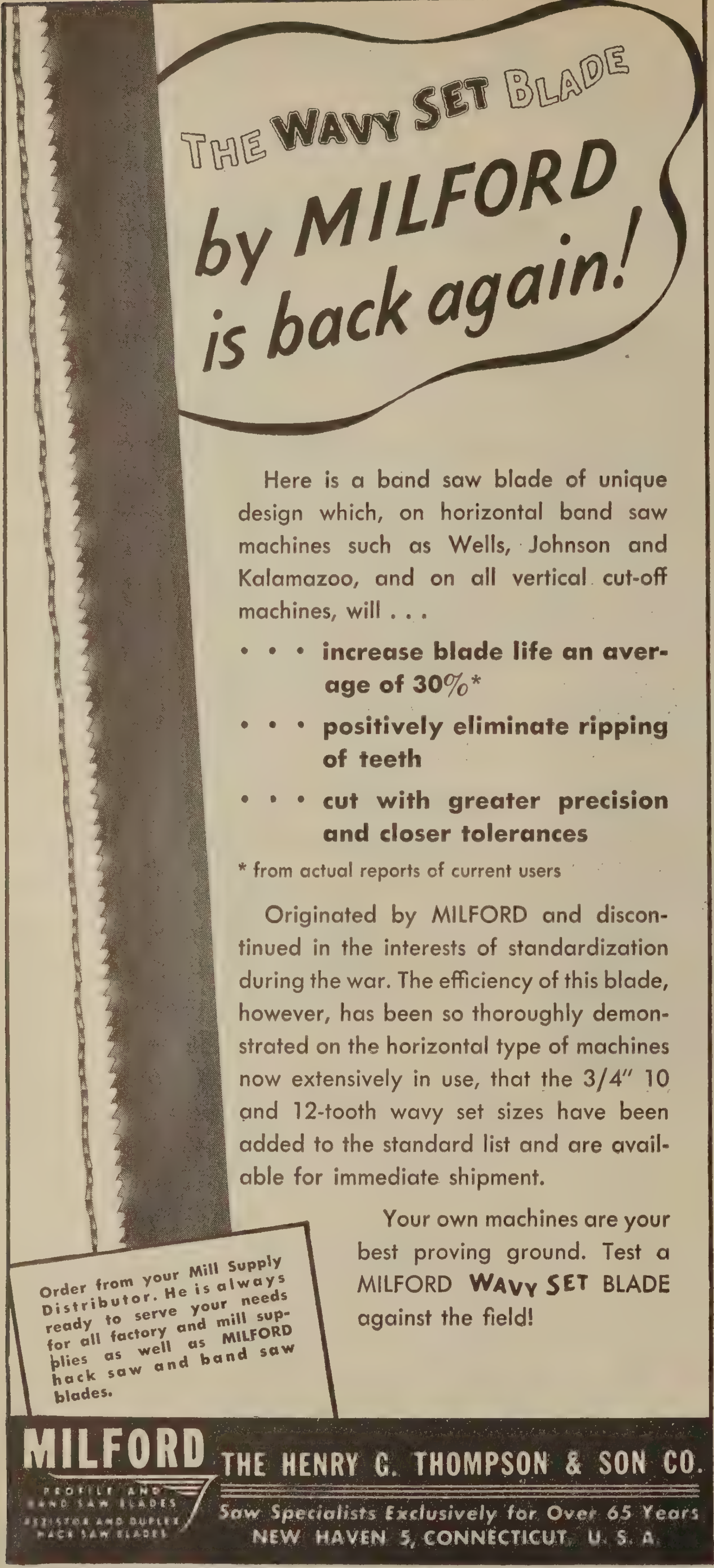

THE WAVY SET BLADE
by MILFORD
is back again!

Here is a band saw blade of unique design which, on horizontal band saw machines such as Wells, Johnson and Kalamazoo, and on all vertical cut-off machines, will . . .

- • • • **increase blade life an average of 30%***
- • • • **positively eliminate ripping of teeth**
- • • • **cut with greater precision and closer tolerances**

* from actual reports of current users

Originated by MILFORD and discontinued in the interests of standardization during the war. The efficiency of this blade, however, has been so thoroughly demonstrated on the horizontal type of machines now extensively in use, that the 3/4" 10 and 12-tooth wavy set sizes have been added to the standard list and are available for immediate shipment.

Your own machines are your best proving ground. Test a MILFORD WAVY SET BLADE against the field!

Order from your Mill Supply Distributor. He is always ready to serve your needs for all factory and mill supplies as well as MILFORD hack saw and band saw blades.

MILFORD
PROFILE AND BAND SAW BLADES
RESISTOR AND DUPLEX HACK SAW BLADES

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Saw Specialists Exclusively for Over 65 Years
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New Level of German Industry Pushes Top Steel Production Up

London

• • • Apart from the expected "protest" from Russia and some doubt among the French, the new plan for industrial Germany drawn up by the Anglo-American military governments has been well received. The industrial capacity retained under the March, 1946, plan was estimated to provide production equal to 55 pct of 1938, which would have been about 70 to 75 pct of 1936 production. The effect of the new plan will be to retain sufficient capacity in the bi-zonal area to approximate the level of industry prevailing in Germany in 1936, a year that was not characterized by either boom or depressed conditions.

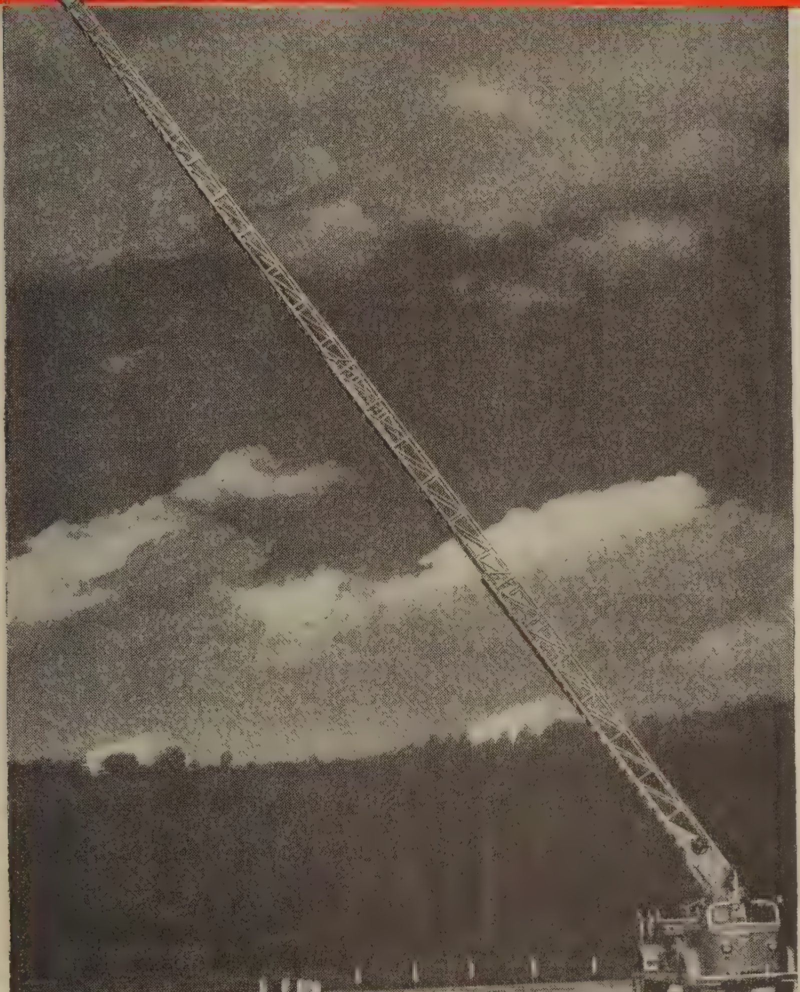
The old plan provided for very sharp cuts in productive capacities in the metals, machinery and chemical industries, from which the bulk of reparations was to be obtained. It has become increasingly obvious during the past 18 months that a self-sustaining economy in the bi-zonal area was impossible without materially increasing the levels of those industries.

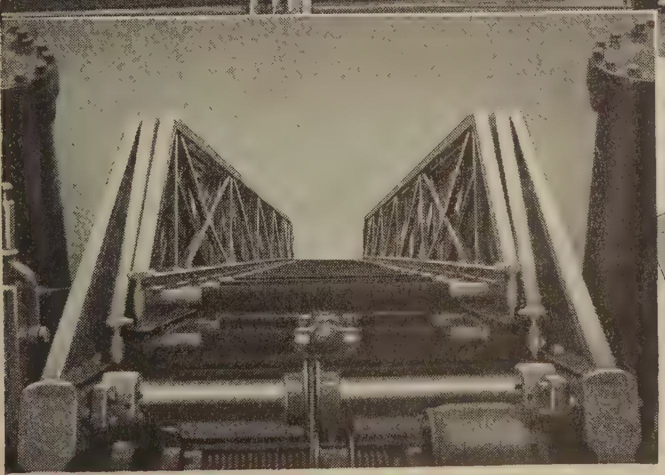
Substantially, the entire difference between the original and revised plan is in these reparations industries, since the original plan already provided for maximum and in some cases unrealistic levels for the non-reparations industries. Under the revised plan, the capacities in the metals, machinery and chemical industries will be sufficient to permit production at levels averaging about 5 or 10 pct less than in 1936. As compared with the war year 1944, the proposed levels represent a reduction of 55 to 60 pct.

The bi-zonal area already has a population at least 6 million more than in 1936, and by 1952 it is expected to have a population from 8 to 10 million greater than prewar. On the basis of an expected population of 42 to 44 million in the area in 1952, the per capita production capacity provided in the new plan would be approximately 75 pct of 1936.

Under the March, 1946, level of

Firefighter With a Reach . . .





Courtesy American-La France-Foamite Corp.

THANKS TO THIS TUBING IDEA

This fire ladder can zip 100 feet straight up in 40 seconds flat—yet, despite its length and light weight, it will bear a one ton load.

Note how steel tubing makes this possible—how the strong, light, square tubular sections are truss-welded into a rigid platform for handling high pressure hose. Even the ladder rungs are tubing.

Although mechanical tubing is widely used to save "machining the hole", it is just as useful in structural applications to save dead weight. It has the added advantage of being easily available — Frasse stocks mechanical tubing alone in hundreds of sizes, in round and square sections, and in carbon, alloy and stainless steel analyses.

It can pay you—in product improvement, cost of production, *often in cost of material*—to think of tubing in your product. And when you think of steel tubing, think of Frasse. *Peter A. Frasse and Co., Inc., 17 Grand Street, New York 13, N. Y. (Walker 5-2200) • 3911 Wissahickon Avenue, Philadelphia 29, Pa. (Baldwin 9-9900) • 50 Exchange Street, Buffalo 3, N. Y. (Washington 2000) • Jersey City • Syracuse • Hartford • Rochester • Baltimore*

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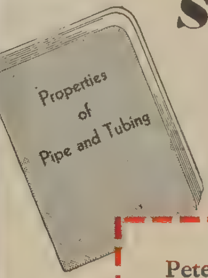

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Revised Level of Restricted Industries in the Anglo-American Zone of Germany

Industry	Revised 1936 Production	Revised Level	Existing Capacity	Revised Level as per cent of 1936	Revised Production as per cent of Existing Capacity
			Million ton		
Steel	14.9	10.7	19.2 (rated capacity)	72	56
Primary Non-Ferrous Metals (Production):			Thousand ton		
Copper, crude	...	128	134	...	96
Copper, refined	...	215	231	...	93
Zinc, refined	...	180	180	...	100
Lead, refined	...	141	141	...	100
Semi-fabricating and casting:					
Copper and zinc[1]	596	535	605	90	88
Lead	72.5	52.2	52.2	72	100
Mechanical Engineering: Machinery[3]:			Million Marks		
Heavy machinery	619	500	775	80	65
Light machinery	769	916	1195	119	77
Machine tools	206	170	259	83	65
			Thousand units		
Automobiles and Tractors:					
Passenger cars	...	160	190	...	84
Commercial vehicles	...	61.5	65	...	95
Agricultural and road tractors	...	[2]19.5	16.5	...	over 100
		Million	Marks		
Fine mechanics and Optics[3]	180	248.7	307.7	138	81
Electrical equipment	830	1237	1291	149	96
		Million	tons		
Cement	7	8.9 (product)	11.4 (rated capacity)	127	100
		Million	marks		
Chemicals Total[3]	2325	2271	4194	98	54
Basic chemicals	270	283	288	105	98
Synthetic ammonia	95	118	118	124	100
Inorganic chemicals	180	180	240	100	75
Miscellaneous chemicals (including military explosives)	1095	1066	2821	97	38
Organic chemicals	160	160	225	100	71
Dyestuffs	180	173	176	96	98
Pharmaceuticals	270	228	263	84	87
Tar distillation	75	63	63	84	100

[1] Combined, as capacity is mainly for production of alloys in the same plant. [2] Existing capacity is less than proposed level. [3] Measured in 1936 prices.

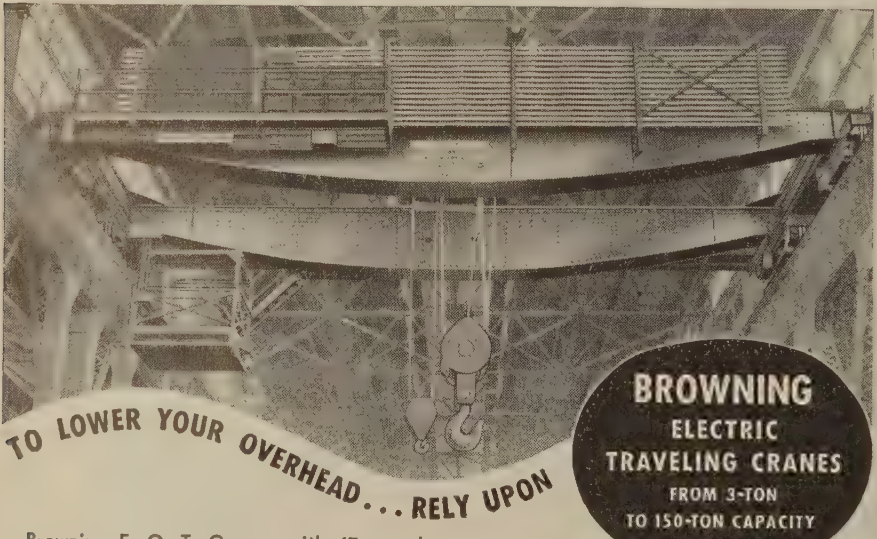
industry plan steel capacity for the whole of Germany is limited to 7.5 million tons, with actual production in any single year not to exceed 5.8 million. This level would be clearly insufficient even to support the level of industry contemplated in the original plan, and it is far too low to provide for the needs of the economy under the revised plan. It has been determined that in order to support the revised level in the bi-zonal area and to permit that area to become self-supporting, the limit of annual steel production in the bi-zonal area shall be fixed at 10.7 million ingot tons per annum and sufficient capacity to produce that tonnage shall be retained.

In the heavy machinery industry sufficient capacity will be retained to produce about 80 pct of prewar production. This leaves 35 pct of the present capacity to be removed as reparations as against 60 pct under the previous plan. In the light machinery industry, capacity will be retained to produce 119 pct of prewar production, leaving 23 pct of present estimated capacity available for reparations as compared with 35 pct under the old plan. Grouping heavy and light machinery together, the revised level is 105 pct of prewar production.

The 1946 plan permits machine-tool production over the whole of Germany of 11.4 pct of 1938 output. The bi-zonal area before the war produced about 43 pct of Germany's machine tools. The present capacity is estimated at 259 million Reichmarks at 1936 prices. It has been determined that capacity sufficient to produce 170 million Reichmarks must be retained in order to support the revised level of industry. This will leave about 35 pct of present capacity for reparations.

In the automotive industry, capacity will be retained for the production of 160,000 passenger cars and 61,500 commercial vehicles. This compares with 40,000 passenger cars and 38,000 trucks allotted to the bi-zonal area under the old plan.

Among the non-ferrous metals, the bi-zonal copper requirements are 93 pct of estimated current refining capacity. Fabricating capacity for 215,000 tons of copper in the bi-zonal area will be retained as compared with 140,000



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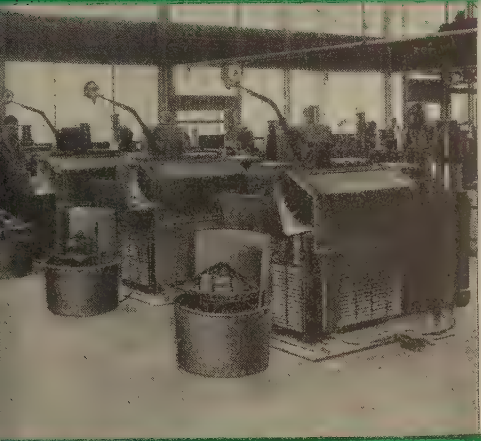
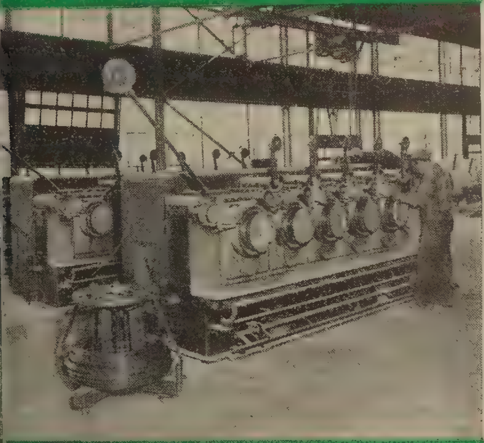


GHN CONTINUOUS MACHINES



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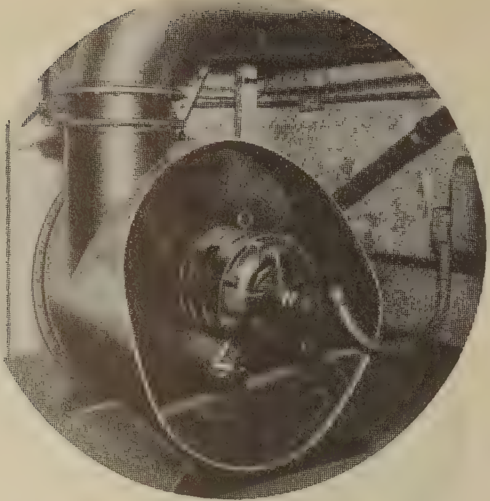

Spencer Foundry Turbo

SPENCER FOUNDRY PROTECTION

for Men, Melts and the Pours

Spencer Turbos are the accepted standard for foundry cupolas because they provide maximum reliability of the air supply over long continuous service. Constant volume or weight of air can be maintained by hand or automatic control whichever is preferred.

High dust counts and shut-downs must be kept to a minimum in the modern foundry.

Spencer Vacuum Cleaners, stationary or portable, remove overhead dirt, clean patterns, molds and castings, and reclaim foundry sand. It helps keep the dust count down.

Both machines are of the centrifugal type with wide clearances, light weight impellers, low peripheral speeds, and only two bearings.

The result, a quiet running machine which requires no special foundations. For reliability, we can refer you to Spencers that have been in service 25 to 40 years.

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Cleaning molds with Spencer Vacuum

332-D

SPENCER
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THE SPENCER TURBINE CO.
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tons for the whole of Germany under the old plan. Production of aluminum, beryllium, vanadium and magnesium is prohibited under the previous level of industry plan. No plant in these industries will be made available for reparations purposes pending further review.

He stays there from 1 to 2 years depending upon his course of training. He then is transferred to a regular section of the plant where he works on a normal schedule, and still attends school. At the completion of his apprenticeship he is graduated and is presented a journeyman's certificate, taking his place in the shop as a full-fledged mechanic.

This careful training program has produced results. More than 60 pct of the supervisors in the East Pittsburgh plant of Westinghouse have risen from the ranks of apprentices, including such men in top management as J. W. Schaffer, manager of industrial relations; D. G. Bolling, manager of manufacturing for the Switchgear and Control Div.; Michael Mehold, acting manager of manufacturing for the Motor Div.; and D. R. Rennie, superintendent of manufacturing for the Micarta Div.

Gas Operating Revenues Up 14.9 Pct Over '46

Washington

• • • **Operating revenues** of the natural gas companies for the fiscal year ending June 30 were up to 14.9 pct over the previous year, according to the Federal Power Commission. At the same time, operating costs were up 13.9 pct and tax payments rose 18.2 pct.

For the 12-month period, aggregate operating revenues amounted to $634 million as compared to $552 million a year earlier; book cost of the gas plants had increased from $1.9 billion in 1946 to $2 billion in 1947.

At the same time, the FPC reported that a major expansion program had been approved by the commission during the year which would increase the natural gas pipeline capacity by nearly 2 billion cu ft daily. Twenty states, 80 major cities and numerous smaller muncicipalities, largely in the Appalachian and midwestern regions, are affected by the program.

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Quality components will be the buyer's surest guide to quality products in the new era of competition. Manufacturers who can stress the quality of essential components will have first claim on purchasers' dollars.

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It is true that Follansbee Steel products are still in short supply. But it is just as true that the specifications for Follansbee specialty steels are rigidly maintained. Therefore, you can plan to use Follansbee steel in products now in the design stage. Just tell us what types and quantities you will need and when you will need them so that we can advise you as to availability.

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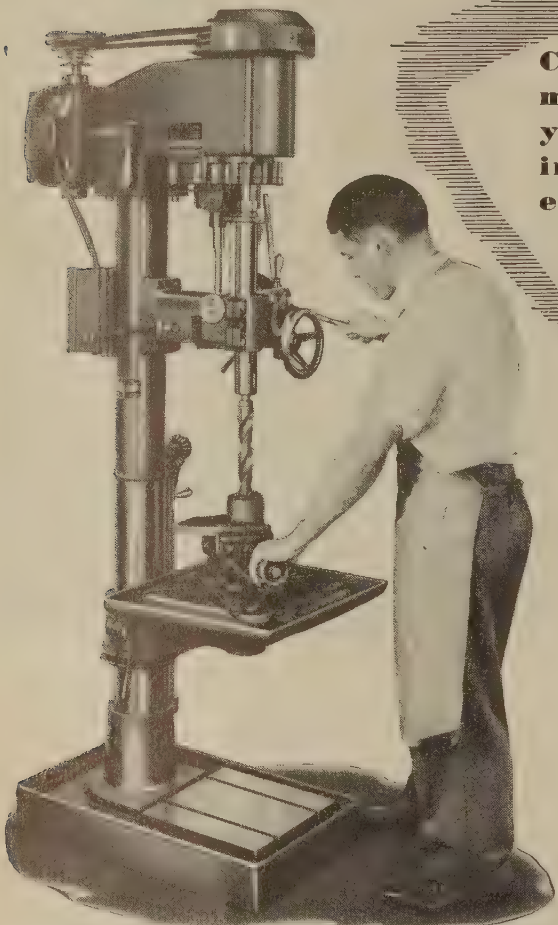

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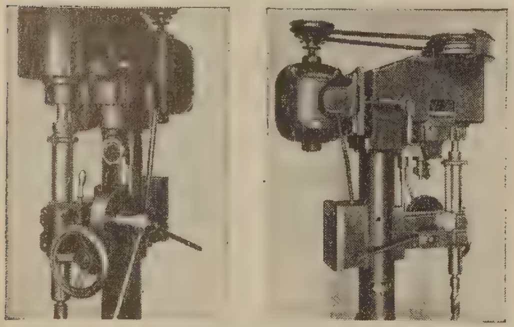

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Predicts a Shortage Of Technical Manpower Into 1949 or 1950

Pittsburgh

• • • **Companies are short** of technically trained men today, and competition for these men is keener than it ever was, according to H. N. Muller, manager of the educational department for Westinghouse Electric Corp. Engineering colleges report a 100 pct increase in the number of companies now interviewing their graduates in comparison to prewar years.

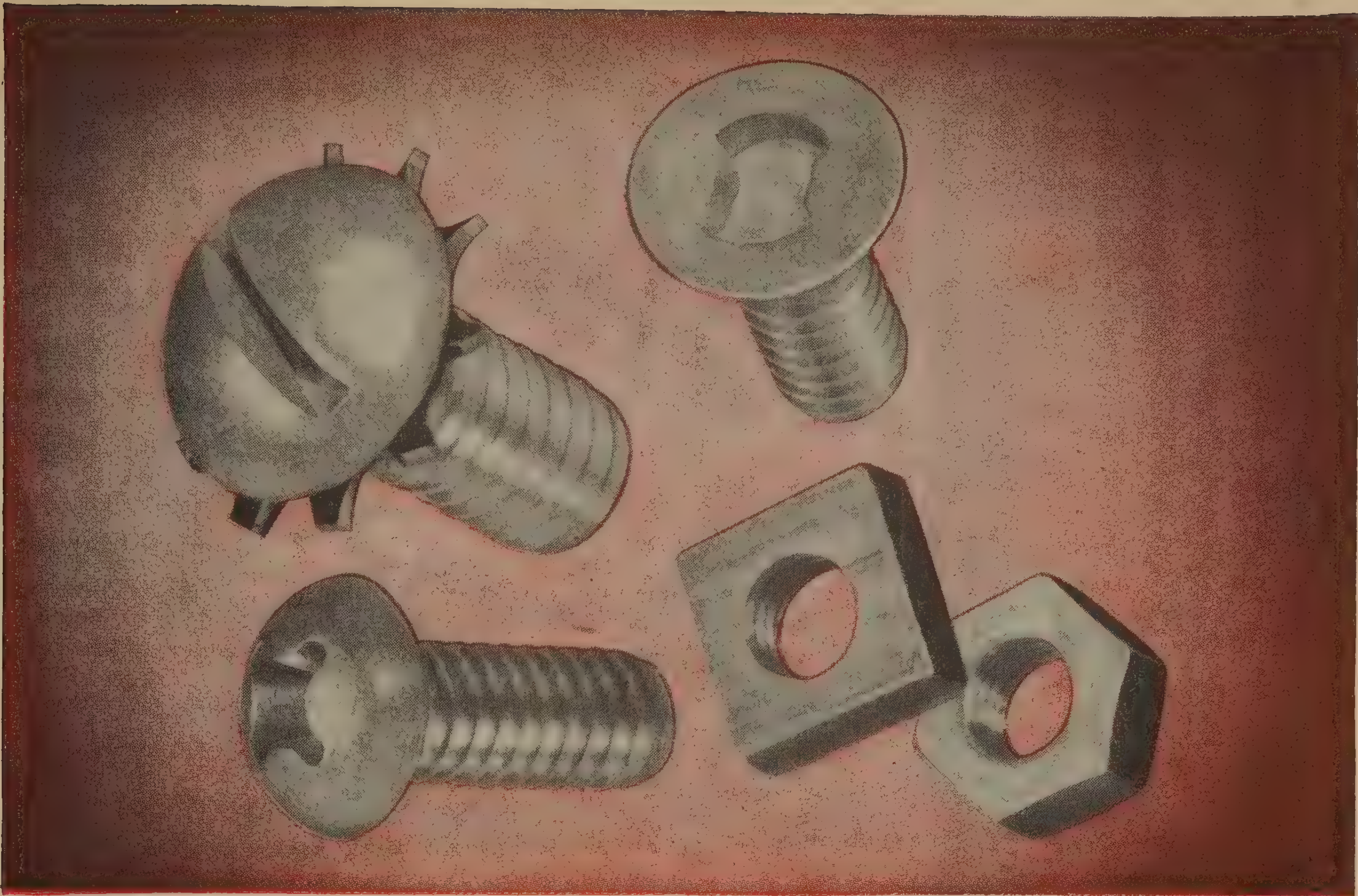
This latest manpower shortage, Mr. Muller predicted, will last well into 1949 or 1950. It stems directly from industrial expansion, coupled with the relatively few engineers and scientists graduated from colleges during the war. Westinghouse alone is now recruiting from the colleges over 100 more men each year than during prewar years.

Starting pay for college graduates is far above prewar levels, Mr. Muller explained. Veterans of World War II are given additional consideration and start at rates even above the new high scale for non-veterans.

The Westinghouse graduate student course was set up many years ago. In college the student learns the fundamentals of engineering but he has no real certainty which branch he is best fitted for—sales, design or manufacturing. At a cost of several thousand dollars Westinghouse helps him find out. Every graduate student at Westinghouse gets a basic course consisting of orientation, production, test and product conference assignments. After completing this basic work the men are assigned to sales, engineering or manufacturing where they receive specialized training.

For 8 weeks or more the student on the graduate course studies manufacturing problems in connection with some dozen of the most important Westinghouse products, such as motors and generators, switchgear, turbines and transformers.

The study of products continues in a full-time "engineering school" for 8 more weeks. This rounds out the preliminary schooling of all students who will go into the technical departments of the company.



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It's the cost of using a fastener that counts

The saving you can make by being able to depend upon your supplier's "quality control" and by reducing inspection in your own plant, invariably amounts to a greater saving than could be effected if a lower price were available.

R B & W *Machine Screws and Stove Bolts Made to One Quality Standard*

At each RB&W plant, quality control is effective at every stage of manufacture—beginning with laboratory analysis of raw materials—*not* just at the end of the production line. The finished product that is delivered to you can be depended upon for uniformly high qualities—giving you a fastening device that assembles at high speed, provides maximum desired holding power and, in terms of finish, is a credit to the appearance of your assembled product.

You Get T. F. E. *When You*

1. Reduce assembly time to a minimum by savings through use of accurate and uniform fasteners
2. Make your men happier by giving them fasteners that make their work easier
3. Reduce need for thorough plant inspection, due to confidence in supplier's quality control
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6. Simplify inventories by standardizing on fewer types and sizes of fasteners
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8. Contribute to sales value of final product by using fasteners with a reputation for dependability and finish

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102 years making strong the things that make America strong

RB&W bolts, nuts, screws, rivets and allied fastening products are manufactured in a broad range of styles, sizes and finishes.

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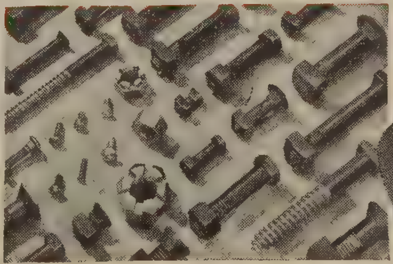
Plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at: Philadelphia, Detroit, Chicago, Chattanooga, Portland, Seattle. Distributors from coast to coast. By ordering through your distributor, you can get prompt service from his stocks for your normal needs. Also—the industry's most complete, easiest-to-use catalog.



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Certain others selected by competitive examination enter a third course of instruction in the mechanical design school. There, for 13 weeks full time, they study the fundamental mechanical engineering subjects of dynamics and vibration, elasticity and strength of materials, applied mathematics and heat transfer in electrical machines.

Electrical engineering graduates also compete for the opportunity of attending an electrical design school offering parallel courses.

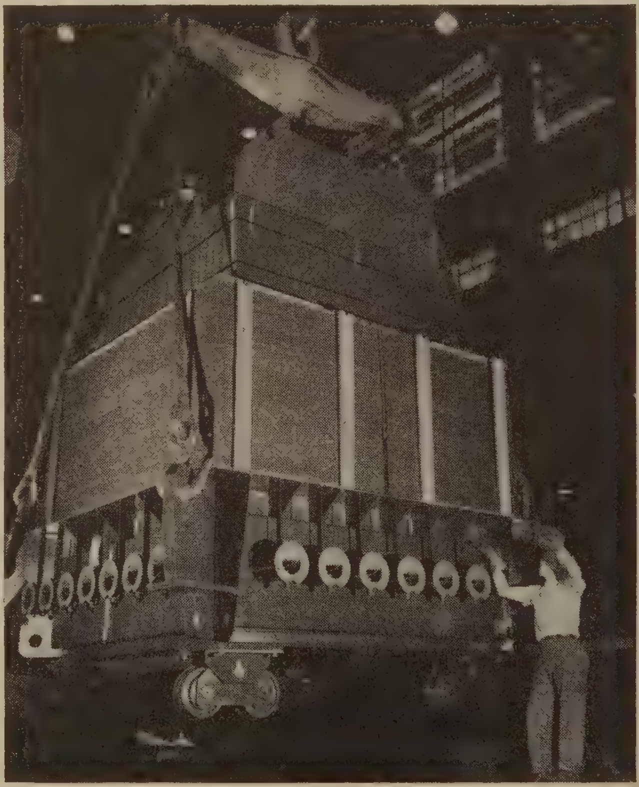
After this round of shop and classroom work, the student engineers get office assignments which give them an opportunity to learn the necessary "paper work." Meanwhile, through periodical conferences with officials of the graduate student training department, the students have been classified for particular engineering activities.

Many of the company's top executives are products of graduate student training. A good example is George H. Bucher, former president of Westinghouse and now vice-chairman of the board of directors.

For those without a college background Westinghouse offers similar opportunities for advancement—in its apprentice training program now in its 52nd year. This program, explained S. J. Dearbeck, supervisor of trades training, provides many of the foremen, group leaders and other supervisors who keep the wheels of production turning.

There is a wide variety of trades from which the mechanically inclined high school graduate can select. They include tool making, die making, bricklaying, printing, electric wiring, sheet metal work and welding, and others. The training is practical and thorough. Most courses cover 4 years, others two.

The apprentice works on a 40-hr week basis. Four of those hours he attends class where he is taught applied mathematics, science, physics, blueprint reading, advanced tool, jig, and die design, and self-development, by experts who are all former journeymen and have had specialized training in teaching. The other 36 hr he spends right on the job working in the training section set aside for apprentices and engaged in actual production work.



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SINGLE PHASE TRANSFORMER: *The highest rated single phase transformer ever built by Westinghouse will soon be installed at a new substation of the Bonneville power project. It is one of four being built at the Sharon, Pa., plant.*

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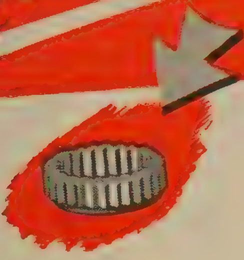
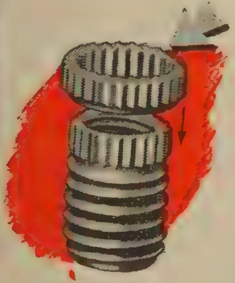
This ring LOCKS Inserts or Studs to Parent Materials



Rosán Locking System prevents loosening or turning—even under vibration

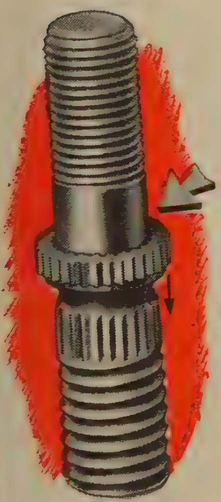
Studs and inserts become an integral part of the parent material with the Rosán Locking System. A ring, serrated both inside and out, locks its inner teeth with the mated collar on the stud or insert, and the outer teeth broach their way into the parent material. Result—a completely permanent installation that can't loosen or turn—yet can be removed easily, if desired, without injuring the parent material.



FASTENERS CAN'T PULL OUT OF SOFT MATERIALS with this Threaded Steel Hole

Rosán Inserts . . . give soft materials the strength of a steel tapped hole to hold fasteners in position under both tension and torque. A serrated ring locks the insert to the parent material so that it can't loosen, turn, or pull out of aluminum, soft metals, plastics or wood.

This threaded steel hole can be removed easily with an ordinary drill and any simple wedging tool—and replaced easily—without disturbing the parent material.



ROSÁN STUDS STAY TIGHT

Rosán Studs . . . can't loosen or turn—even under vibration—because the serrated ring locks the stud to the parent material. Rosán Studs can be removed and replaced easily—with simple tools.

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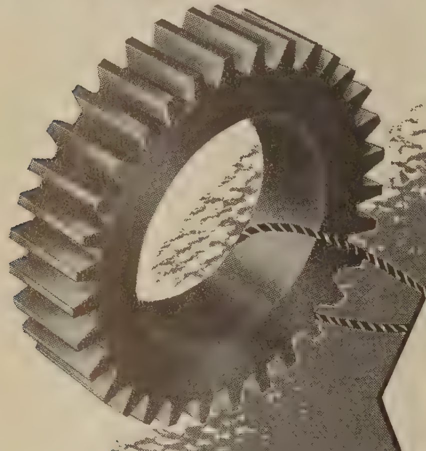

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States Steel Industry Lacks the Capacity To Meet Present Demand

Cleveland

• • • **Henry Ford II**, president of the Ford Motor Co., told members of the Automotive and Aviation Parts Manufacturers, Inc., at their annual meeting here, that the nub of today's problems is that people all over the world are starved for things that the world's present production cannot come close to meeting.

"The truth seems to be that the postwar demand for production was vastly underestimated," he added.

"Leaders in the petroleum industry, for example, tell us that they expected a sharp falling off from wartime demand, and that the industry would have a breather during which it could get organized for an ultimate rise in the world demand for petroleum products.

"The fact of the matter is, however, that the curve of petroleum demand never did go down and has pushed steadily upward," Mr. Ford pointed out.

"The steel industry does not have the capacity to make all the steel that many of us desperately need and want."

Frederick C. Crawford, president, Thompson Products, Inc., and past president of AAPM, welcomed some 600 members of the association to Cleveland, marking the first time in AAPM history that the annual meeting was not held in Detroit, and spoke briefly of the "good old days before birth control was placed over new business."

He was followed by John Airey, AAPM president and president of King Seeley Corp., who introduced Henry Ford II not as the president of the Ford Motor Co., but as THE FORD MOTOR CO.

Mr. Ford told the 600 AAPM delegates that "if we can agree that the No. 1 problem of the world today is production, I think we must also recognize that filling the vast economic hole left by World War II is beyond the strength of any nation, including the United States."

He said the U. S. has achieved

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"finest spray gun of them all"

Spray operators and top management alike are enthusiastic in their praise of the DeVilbiss MBC. They have learned through actual experience that the MBC produces finer finishes—year in and year out—on all spray painting and coating operations. That's why it is so widely used for so many purposes in so many industries everywhere.

Consistent outstanding performance and long life is the logical result of advanced design and construction in every single detail. The DeVilbiss MBC is sturdily built to withstand the abuse of constant day after day service—yet, it's lightweight and versatile. It handles easily—sprays all types of materials—on all kinds of surfaces. The removable spray head, another outstanding DeVilbiss feature, saves valuable time in changing from one material to another.

Depend on the DeVilbiss MBC—*finest spray gun of them all* to always obtain the finest quality finishes. And depend on your DeVilbiss engineer for expert help on all your coating and finishing problems.

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Canadian Plant: WINDSOR, ONTARIO

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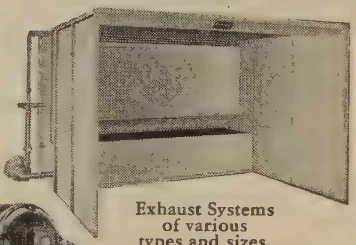
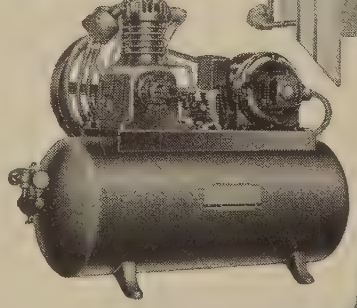


Exhaust Systems of various types and sizes.



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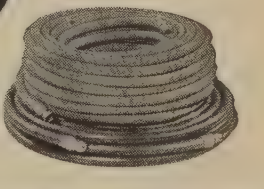

Air Hose, Fluid Hose, and Connections for long useful service.

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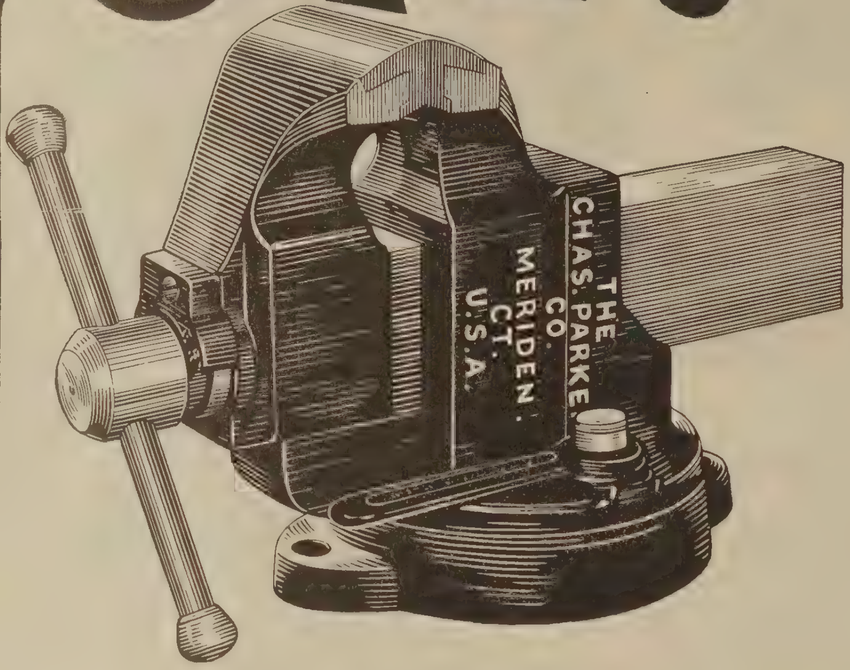
HOSE & CONNECTIONS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PARKER VISES provide that first essential — G-R-I-P — the powerful grip that "welds the work to the bench". Inbuilt features—from our years of skill and experience—make this power productive for your customers. Sell Parkers where other vises have been found wanting. Your distributor will be glad to supply you. The Charles Parker Co., Meriden, Conn.

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Tool steel jaws—renewable.
Solid cast underportion— no slack.
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America's First Vise Maker

GRIP LINE A GRIZZLY

an output beyond anything we imagined possible; that the U. S. has sent more goods abroad in the past 2 years than in any peacetime years of our history.

"And yet, in spite of the fact that we consumed more at home than ever before, we find that our domestic wants are so inadequately filled at the present time that prices are continually running away from us, while many nations abroad are still in desperate straits."

Mr. Ford declared the United States cannot become the economic life-saver for the world and unless we are prepared to make gigantic gifts over a long period of time, we must ultimately receive in exchange for our production the production of other nations.

"So far as our own best interests are concerned, it seems clear that our job is not only to continue to increase the productive capacity of America, but to do everything we can to rebuild and expand the ability of the rest of the world to produce."

He said Ford Motor Co. since the end of the war has spent in this country more than $97 million in rehabilitation of plants, in modernizing equipments and in expansion.

"Our plans for the next 12 months call for the expenditure of $100 million more for the same purposes."

He said the worldwide deficit in production is something that American business men are more competent to tackle than any other group in the world.

"But we must tackle this job with vision and boldness, because our job is the vital one in helping to establish a firm economic basis for a peaceful world."

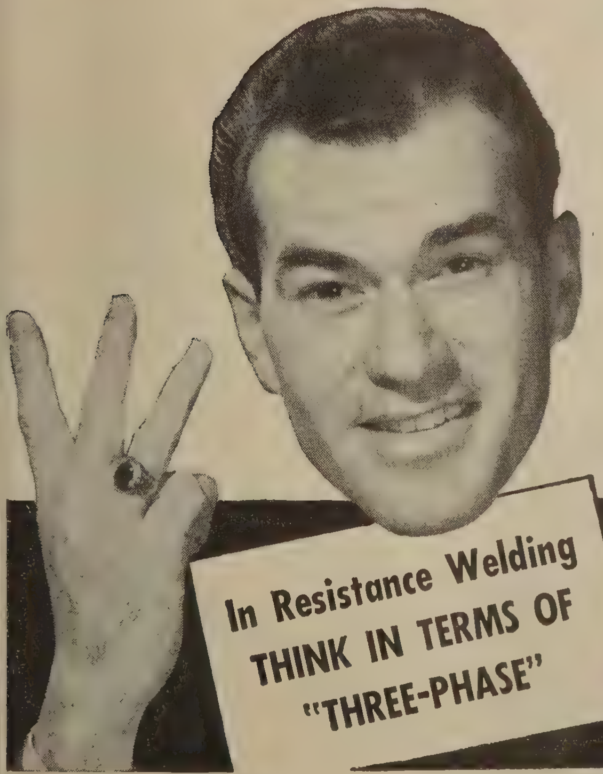
AAPM is a trade association of nearly 400 manufacturers of automobile, truck and airplane parts, which began as an NRA baby in 1933 as the Automotive Parts and Equipment Code Authority. Although NRA died young, the parts manufacturers decided to incorporate the association under the name Automotive Parts and Equipment Manufacturers, Inc., and carry it on as a trade association. AAPM is a manufacturers group with no jobber or wholesale members.

Going to the Metal Show?

(October 18th—International Amphitheatre, Chicago)

75% LESS CURRENT
BALANCED LOAD
HIGH POWER FACTOR

see Three-Phase* welding!


In Resistance Welding
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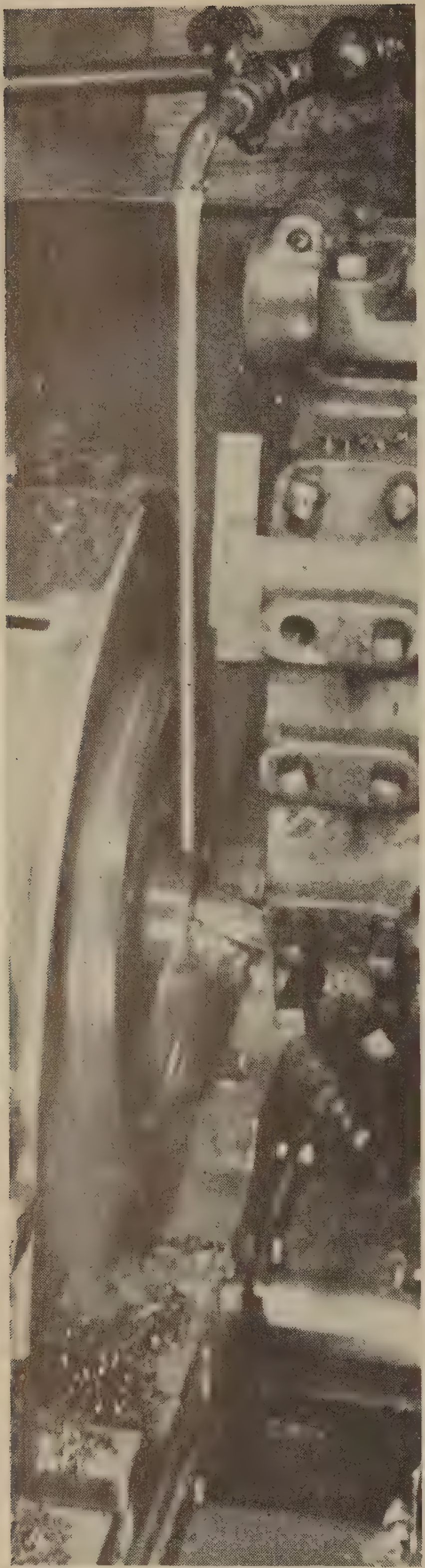

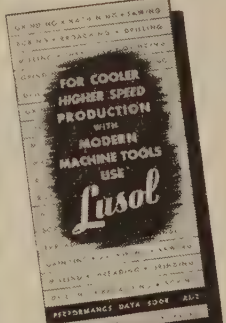

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To Discuss Abrasives And Material Handling At ASTE Convention

Boston

• • • A **new concept** in abrasives, material handling, bearing applications, the importance of welding to the tool engineer, tooling for watches and clocks, and the professional development of the tool engineer will be the main themes for discussion at the 15th semiannual convention of the American Society of Tool Engineers at Boston, Oct. 30 through Nov. 1.

At the national banquet on Saturday evening, Nov. 1, Clayton R. Burt, chairman of the board, Niles - Bement - Pond Co., West Hartford, Conn., will be the guest speaker. His address will deal with the progress of the tool engineer and his contribution to the machine tool industry.

Also scheduled is a series of plant tours during the 3 day convention to various local plants including Chelsea Clock Co., Chelsea; Boston Gear Works, Inc., North Quincy; Ford Motor Co., Somerville; U. S. Naval Ship Yard, Boston; W. H. Nichols Co., Waltham; General Electric Co., Lynn; Simmonds Saw & Steel Co., Fitchburg, and Pneumatic Scale Corp., Ltd., North Quincy. On the last day of the convention, Massachusetts Institute of Technology, at Cambridge, is planning an Open House at all of its engineering laboratories. In addition to the scheduled plant tours, other similar tours to various manufacturing plants in the area have been set up.

Motion pictures on the working of magnesium, time-motion studies, honing and sizing, and employee training and working conditions will be shown at various times during the convention.

Foremost, however, are the technical papers that will be presented at the six technical sessions. The afternoon session on Thursday, October 30, entitled "A New Concept in the Field of Abrasives — 32 Alundum," will consist of discussion of this product by three representatives of the Norton Co., Worcester, Mass. —W. T. Montague, vice-president; A. A. Klein, assistant director of research, and G. T. Rideout, sales

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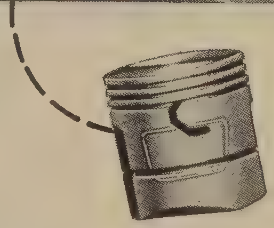

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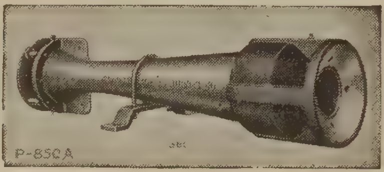

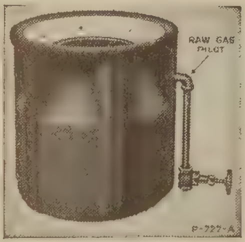

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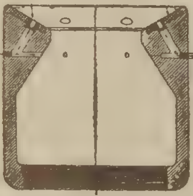

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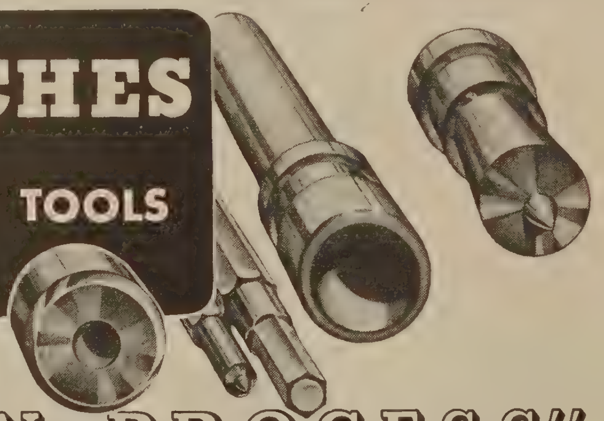

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manager. The evening meeting, "The Importance of Welding to the Tool Engineer," consists of two papers by General Electric Co. representatives. E. H. Girardot, foreman of tool design at Schenectady, will present a paper entitled "Welding as Applied to the Construction of Tools, Dies, Jigs and Fixtures," and D. W. Puffer, of GE's welding section at Lynn, Mass., will talk on "Arc, Gas and Resistance Welding."

The Friday session on "Material Handling" and "Bearing Applications" will include six papers. Edward J. Burnell, vice-president, Link Belt Co., Chicago, will cover the "Economics of Good Material Handling Equipment"; C. A. Litzler, president of Industrial Ovens, Inc., Cleveland, will talk on "The Handling of Webs and Monofilaments"; P. R. Minich, district manager of Rack Engineering Co., Pittsburgh, will have a paper on "Material Handling in the Efficiently Organized Plant."

Homer H. Dasey, president, Visual Production Planning, Inc., Pittsburgh, will talk on "Visual Planning for Production." At the evening session, on bearing applications, two papers, "Bearing Selection" and "Plain Bearings," will be presented by F. E. Ericson, executive vice-president of Barden Corp., Danbury, Conn., and Lewis Sandler, executive vice-president, Johnson Bronze Co., New Castle, Pa.

On the closing day of the convention, Saturday, the general meetings on the "Professional Development of the Tool Engineer" and "Tooling for Watches and Clocks" will be held. "Industry Needs More and Better Tool Engineers" is the title on a paper by William D. Merrifield, assistant director in charge of technical training at Chrysler Corp., Detroit, and Dr. William T. Alexander, dean of engineering at Boston's Northeastern University, will talk on "The Tool Engineer and America's Defense."

Three papers on "Tooling for Watches and Clocks" will be presented at the afternoon session. These papers will be: "Tooling for Electric Clocks" by Harry B. Whitehead, general superintendent of Telechron, Inc., Ashland, Mass.; "Tooling for a Fine Watch" by E. W. Drescher, superintendent of production at Hamilton Watch Co., Lancaster, Pa., and "Mass Production of Watches and Clocks" by Roger M. Tarpy, managing director of Vulcan New England Co., industrial consultants, West Hartford, Conn.

Bulk of $625 Million Spent During 1947 For Government Research

Washington

• • • **More than 50** government agencies spent approximately $625 million on scientific research in fiscal 1947, the White House reported last week. About one-third of the investigations were conducted in government laboratories. The remaining two-thirds were farmed out to colleges, universities and private laboratories.

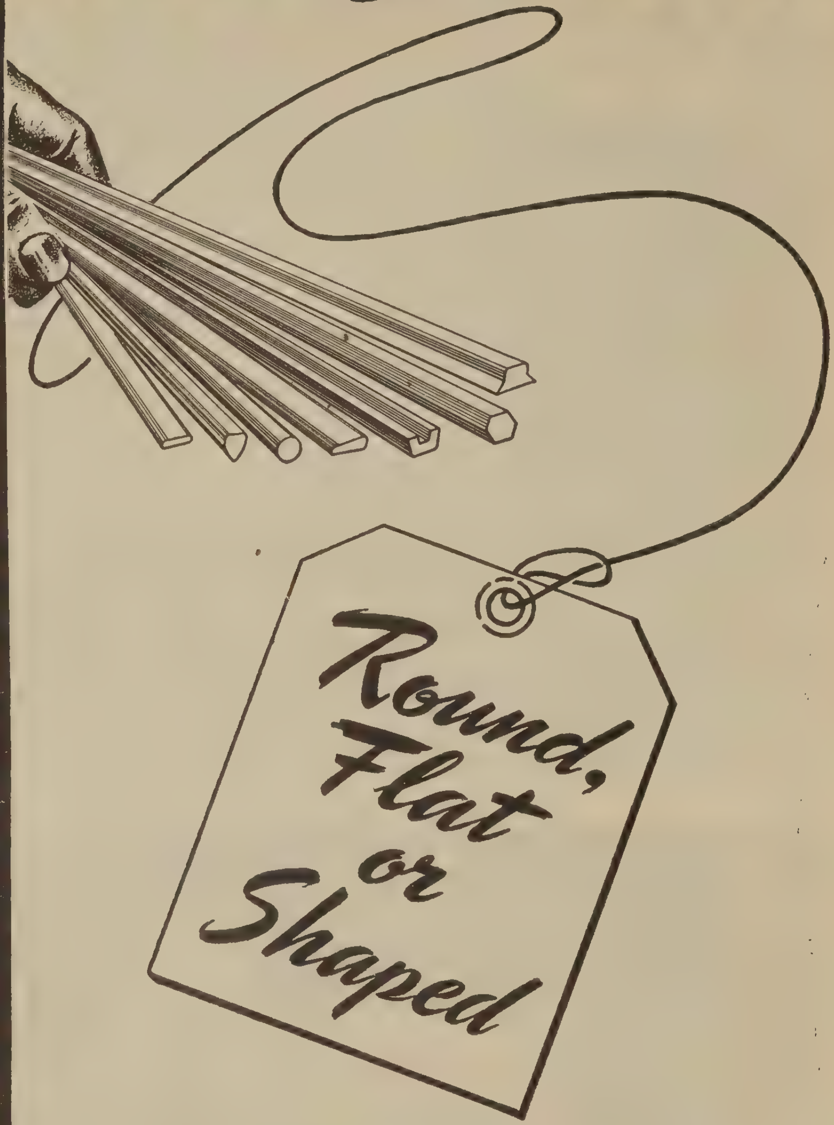
Scope of the government's research activities was revealed in vol. 2 of "Science and Public Policy," prepared by White House assistant John R. Steelman, who is chairman of the President's Scientific Research Board. Mr. Steelman said in his report that the great bulk of the $625 million was spent for applied and development research studies, while fundamental and background research lagged.

The Army and Navy showed the greatest interest in research, spending $237 million and $262 million, respectively. Other principal participants were the Agriculture Dept., Interior Dept., National Advisory Committee for Aeronautics, Federal Security Agency, Commerce Dept., Federal Loan Agency, Tennessee Valley Authority, Veterans Administration, Federal Works Agency, Smithsonian Institution, Treasury Dept., Federal Communications Commission and Maritime Commission.

The Navy, biggest spender, conducted research activity in every major bureau and office. The Office of Naval Research, besides coordinating the Navy's entire research program, supervises three laboratories and research centers and supports a program of basic research through contracts with colleges and universities.

ONR now supports about 600 basic research projects in more than 150 colleges, universities

PAGE Stainless Steel WIRE



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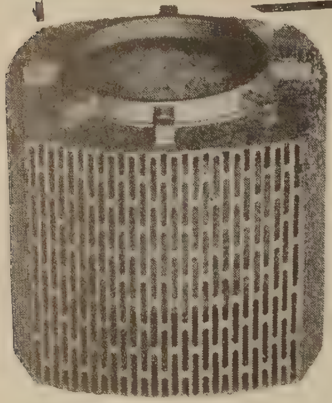

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and other nonprofit institutions. More than half of these contracts are for $20 million or less. The Navy's Bureau of Aeronautics currently is experimenting with aircraft, engines and engine components, while the Bureau of Ordnance is exploring the fields of ammunition and explosives, armor, projectiles, bombs, ballistics, rockets, fire control, guns and mounts, underwater ordnance, aviation ordnance, guided missiles, jet propulsion and countermeasures.

The Army Air Forces spent $149 million of the Army's total $237 billion research figure. AAF devoted its attention to aircraft and missiles, experimental power planes, radio and radar, service test equipment, all-weather operations, aircraft armament, machinery and apparatus, propellers, aircraft equipment and designs.

Army Ordnance research takes in a wide range of developmental activities from truck axles to high altitude supersonic rockets. Principal fields of endeavor are: Basic artillery research and long-range development, submarine mines, tank and motor transport, bombs and pyrotechnics, artillery ammunition, proximity fuzes, rockets, rocket launchers, guided missiles, small arms and small arms ammunition, ballistic research and materials research.

Justification for Commerce Dept. research lies in the stimulation of business and resultant endeavor, Mr. Steelman points out in his report. Commerce Dept. research activity is administered through the Bureau of Standards, the Civil Aeronautics Administration, the Office of Technical Services and the National Inventors Council, and the Patent Office.

President Truman, in commenting on Mr. Steelman's report, pointed out that the scope of federal research "extends from the development of guided missiles, rockets and other military devices to the control of soil erosion and the development of disease-resistant plants." "Federal research," he stated, "affects the health and comfort and security of every citizen in countless ways."

Government Agencies Free 2 Million Tons Of Scrap During '47

Washington

• • • **Indications now** are that governmental agencies will have turned over to industry nearly 2 million tons of iron and steel scrap before the end of the year, according to John R. Steelman, assistant to the President. This would exceed government promises by 50 pct.

Various agencies which owned or were sources of government-owned scrap last March committed themselves to provide industry with 1,250,000 tons, the White House said. For the period of March through August, some 1 million tons plus had been made available. During the remaining 4 months, prospects were bright for an additional 850,000 or more tons to become available.

These agencies—War Assets Administration, Maritime Commission, and the National Defense Establishment (Army and Navy)—have told the White House that another 1,250,000 tons of scrap can be made available during the first half of 1948.

Some 525,000 tons of this amount, however, will be Army-Navy generated scrap collected in overseas war theaters and is being or will be sold with the stipulation that it must be returned to the United States.

At a conference with the four agencies at the White House, Mr. Steelman lauded the work done in scrap gathering and disposal; at the same time, he emphasized the acute need for continued effort.

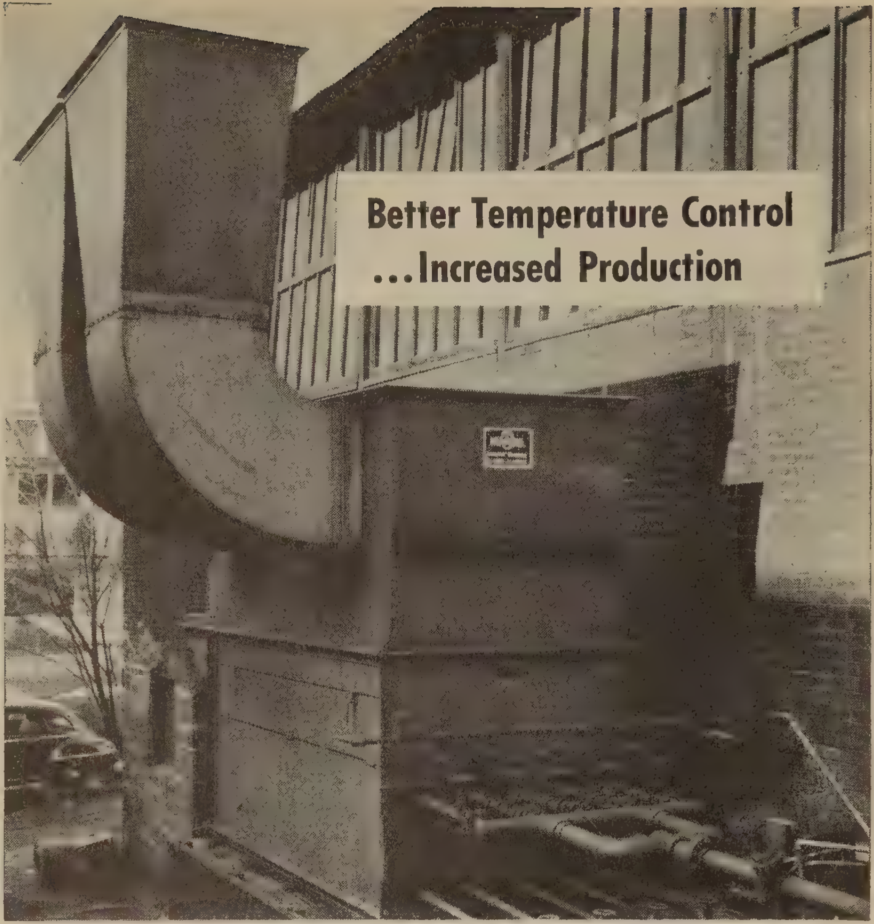
"There is grave danger," he warned, "that some steel mills may have to curtail operations this winter unless scrap supplies can be maintained at a high level."

GOVERNMENTAL SCRAP DISPOSALS

(Long Tons)

DOMESTIC	1947 Mar.-Aug. Actual	1947 Sept.-Dec. Est.	1948 Jan.-June Est.
Dept. of the Army..	244,000	150,000	300,000
Dept. of the Navy..	289,000	200,000	130,000
Maritime Commission	312,000	400,000	200,000
War Assets Administration ..	199,000	100,000	75,000
OVERSEAS			
Dept. of the Army..	......	......	500,000
Dept. of the Navy..	......	......	25,000
Total	1,044,000	850,000	1,230,000

This table represents a break-



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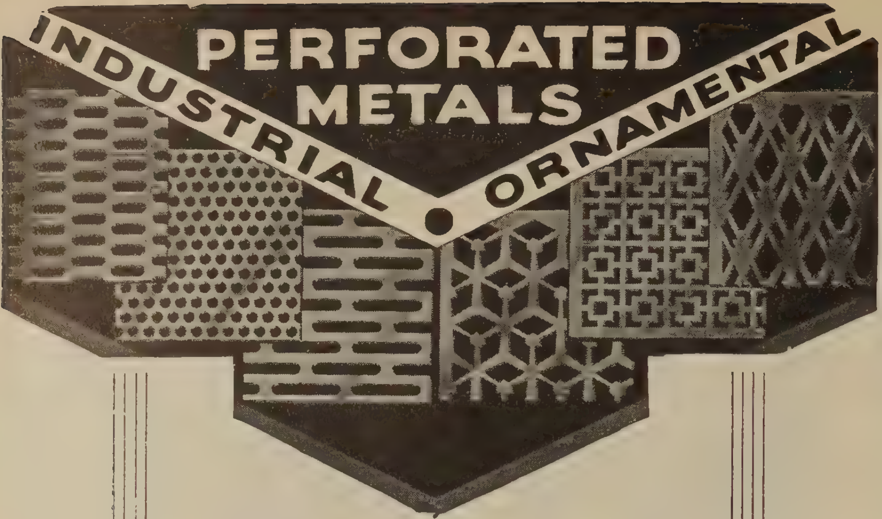

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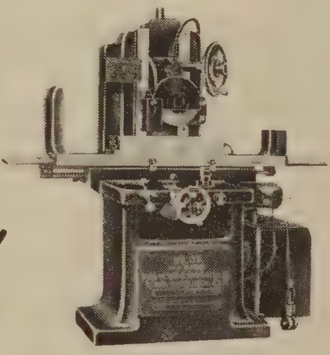

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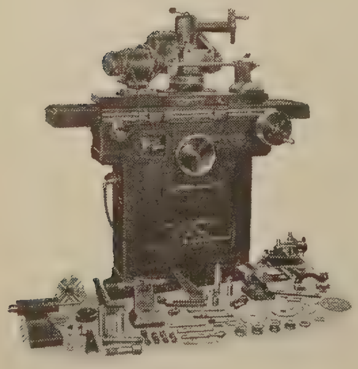

Grand Rapids No. 60
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Write for Bulletin 2-28-46

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down by agency and by tonnage the amounts of scrap which the specified agencies reported to the White House on Sept. 23 as having been made available for the use of American industry. The scrap estimated overseas will not be available until during the first half of 1948; this does not include about 150,000 tons already sold in Europe and which is expected to be returned shortly.

British Exports Value Declines; Mostly In Manufactured Goods

London

• • • **The value of** United Kingdom exports in August, $374.4 million, was $66.8 million less than in July, but otherwise the highest since December 1920. The fall was due to the general effects of the holiday season, and also to the ct that August was a short nth, containing only 25 working days, as against 27 in July. The fall in the value of exports occurred almost entirely in manufactured goods, the values of food, drink and tobacco, and of raw materials being essentially unchanged.

Among manufactured articles there was only a small decline in the textile groups of $3.2 million, so that the proportion of these to total exports increased from 17½ pct in July to 19½ pct in August, whereas the metal groups as a whole, although falling by $36.4 million, represented about the same proportion of total exports in the 2 months. The value of machinery exported fell by $8 million to $61.2 million and vehicles by $12.8 million to $54 million.

Exports of coal, 79,000 tons, have been little changed in the last 3 months, remaining at about 2 pct of 1938. Exports of brass scrap for refining and subsequent return of the copper reached the record figure of $5.6 million.

The total value of exports of metal goods in August, $181.6 million—55 pct of the total for manufactured goods, was one sixth below that in July, but otherwise the highest monthly figure recorded.

The total tonnage of machinery exported, 57,529 tons, was, apart from July, the highest since May 1929, exceeding the 1938 average by one half. Exports were higher than in July only for agricultural machinery, but, apart from boilers and boiler-house plant and machine tools, shipments of all types were well above the May-June average. Compared with 1938 the most important increases were those for agricultural machinery, over three times as high, machine tools, more than double, and electrical machinery, one half higher.

For both new motor cars and for commercial vehicles and chassis, the numbers exported in August were the lowest since April; the reductions compared with July were nearly one quarter for motor cars and nearly two fifths for commercial vehicles, but exports were in each case over two and one half times as high as in 1938.

Exports of motor cycles, 5,249, were one sixth below the high July figure and those of pedal cycles, two and a half times those in 1938, were substantially unchanged. Exports of locomotives and parts were two fifths lower than in July, but those of other railway rolling stock increased to one half above the prewar average.

Total exports of iron and steel, 142,000 tons — less than three quarters of those in July, were below the 1938 level for the first time since April. Compared with the three preceding months, the reductions were proportionately much heavier for crude iron and steel and rolling mill products than for the more finished goods. Exports of aluminum, brass and copper, including manufactures, though substantially lower than in July, were still well above the prewar levels.

Sells Chemical Equipment

Washington

• • • **Equipment of two** German chemical plants, the A. G. Geesthacht-Krummel Dynamit and the Paraxol plant at Lippoldsburg, will be sold to United States industry as part of the reparations program, the Foreign Liquidation Commissioner announces.

The Krummel plant is equipped to produce plastics and the Paraxol facility manufactures formaldehyde and pentarythritol. Information as to inventories and bids, which must be submitted by Dec. 10, may be obtained from the commissioner's office in Washington.

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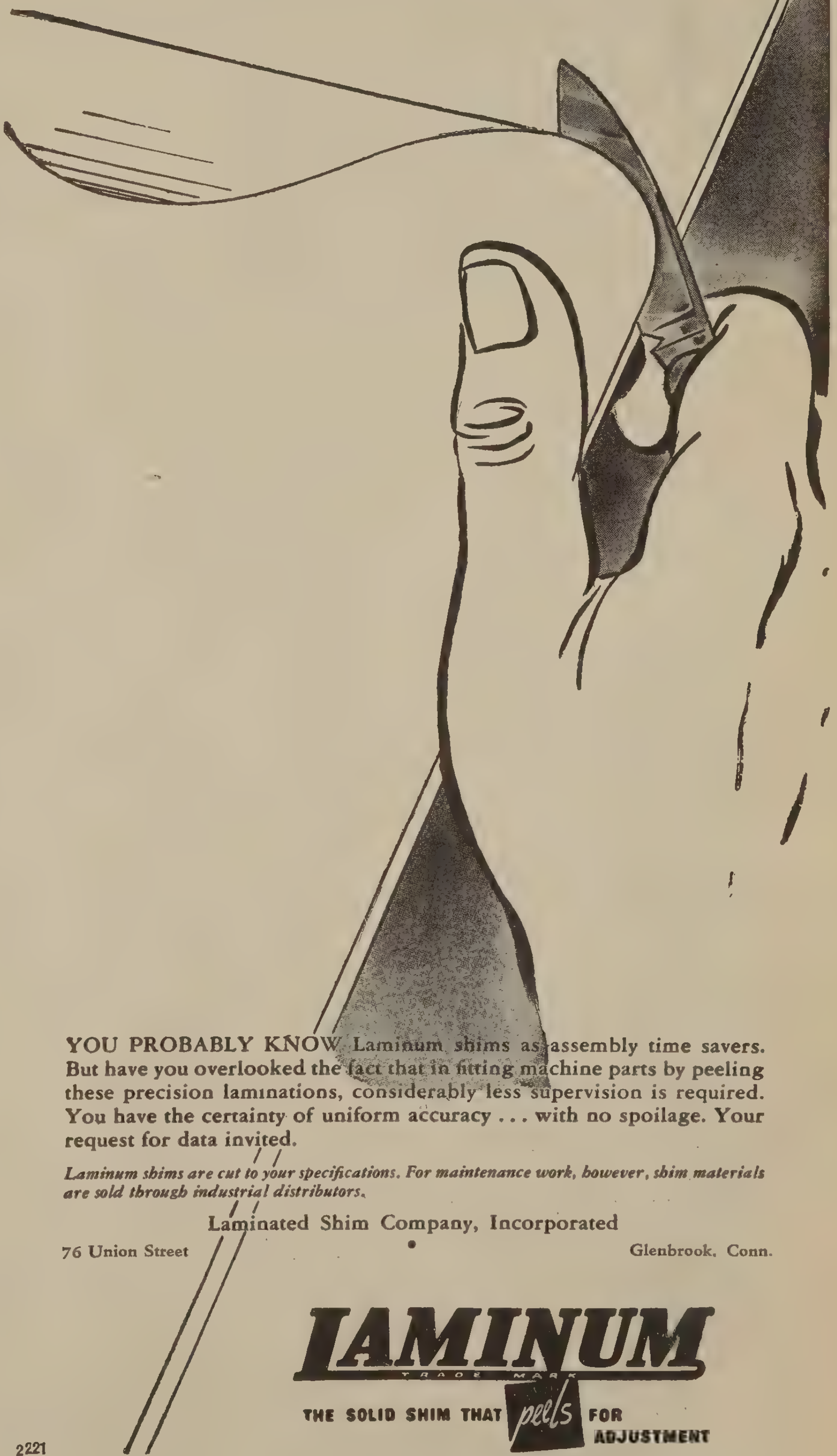

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NMTBA Reports Tool Shipments of $16,482,635 in August

Dealers See No Evidence Of New Orders in Face Of Tool Show Optimism

° ° °

• • • **Shipments** of machine tools reported by members of National Machine Tool Builders' Assn. totaled $16,482,635 in August, and the estimated industry total from shipments reported totaled $18,520,000. Unfilled orders as of the end of August totaled $122,853,741.

In July, shipments totaled $16,842,587 by NMTBA members and unfilled orders totaled $124,154,946. The estimated industry total from shipments reported was $18,924,000.

Shipments of machine tools in July and August fell off sharply from June, when shipments by NMTBA members totaled $21,944,699 and the estimated industry total from shipments reported was $24,383,000.

High point in shipments to date in 1947 was March, when association members shipped $26,400,741 and the estimated industry total was $29,012,000.

In the East dealers report that the optimistic outlook for business originating at the Machine Tool Show was not based on firm ground. Dealers in the East have seen no evidence of new orders developed at the show and point out that many of the machines reported to have been sold off the floor were the results of commitments made weeks and months in advance.

While inquiries still come in to dealers, especially from the larger manufacturers, smaller metal workers are about out of the market. The foreign inactivity can be illustrated by the report of one big rebuilder who received a buyer from the Netherlands who was willing to buy out most of the machines on his floor, provided the purchase price could be kept in Holland.

The trend toward diversification of products and its effect in multiplying the number of producers of any given product is indicated by an independent survey of the producers of automobile jacks. Before the war there were only 40 jack manufacturers; today there are some 900. At the present time, most manufacturers are able to sell their production. When industry returns to a buyer's market, it is obvious that some producers must be forced out of business.

In Cincinnati, sources in the trade report that new firm orders have not increased appreciably in the face of continued optimism by major producers, apparently engendered by the large volume of inquiries stimulated by the Machine Tool Show.

Several producers have indicated that requests for quotations have been extremely brisk and that most tool users are interested in retooling. Generally, a rise in booking volume is expected this fall, although financing arrangements are still retarding foreign business. Some ordering is reported, but this is spotty and defies any definition of a trend.

In Washington, a machine tool rebuilding program, designed to interest producers, dealers and established rebuilders is being bandied about by War Assets Administration, and various representatives of interested groups. Present indications are that unless the Joint Army-Navy Machine Tool program picks up the remaining machines in good condition, WAA's proposal will fall on deaf ears.

The important segments of the machine tool industry are not opposed to rebuilding, but present costs v. present discounts make it an economic impossibility. Reliable sources in the industry believe, however, that rebuilding on a fairly broad scale is a definite possibility, if and when WAA's stocks of good, productive machines are either exhausted or picked up by JANMAT for storage.

While it is too early to foresee the possible effects of the recent Chicago Machine Tool Show on the potential volume of Detroit business, there are many reports that a sizable volume of business was written up at Chicago. In addition, the number of inquiries reaching manufacturers and dealers has been stepped up noticeably during the past week.

In a survey of manufacturers and dealers in the Detroit area, no disappointment was expressed as to the volume of business attracted by the Chicago showing; the question everyone was asking was "Just how big is our market now that prospective machine tool buyers are fully familiar with the merits of our newest equipment?"

During the past week a sizable order for machine tools for the Chevrolet-Cleveland plant has been reported. Similarly, Kaiser-Frazer is aggressively pursuing its policy of straightening its position as the fourth largest producer and the leading independent in the industry. A substantial volume of K-F orders for new machines has been reported, although disposition of the new equipment has not been indicated.

In contrast to new business, the final blow on the Detroit transmission program came recently when several suppliers received orders to cancel both standard and special machines for the Detroit plant project. No reason has been given for the cancellation, but possible major changes in GM's transmission program seemed to be the best explanation.

Informed sources report that the GM tooling program for 1948 is well advanced. Cadillac, Buick and Olds will have new bodies and, in some instances, new power plants. Pontiac and Chevrolet will have only a "face-lift" for the present with new models coming along possibly in the autumn.

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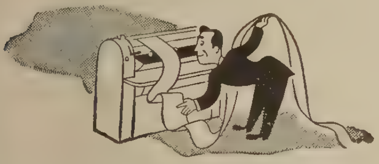

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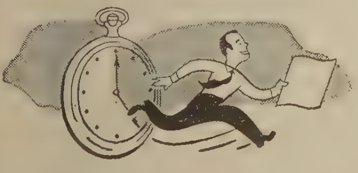

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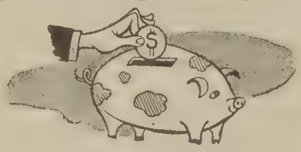

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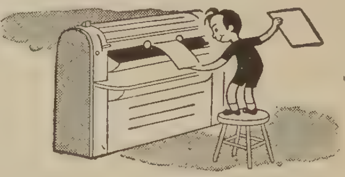

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DEPT. 346

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NONFERROUS METALS

. . . News and Market Activities

Copper

• • • **Producers report** that the sale of copper continues at a good level for November delivery and some predict that tonnage may be expected to exceed high October shipments when reported. Export demand for copper is showing increased firmness and is reflecting a number of relatively small orders despite the shortage of dollars abroad. However, any significant increase in export volume must await new developments in the currency picture abroad. Export prices are reported to have improved to the range of 21.375¢ to 21.50¢ f. a. s. New York. During the week Revere Copper & Brass and American Brass Co. followed the lead of Chase Brass & Copper Co. in establishing a firm price policy for mill product orders deliverable within 60 days. It is expected that the entire brass mill industry will soon be on that basis. While the volume of business in copper futures is light, it is apparent that the futures market is rising, with the growing conviction that the copper market may be expected to continue firm for some time.

Zinc

• • • **Demand continues** steady and consumers are able to obtain their requirements in all grades. Although the statistics released by the American Zinc Institute for September indicate stocks at the end of the month have grown by 4343 tons to a total of 195,260, there is no uneasiness in the trade over this report. This is largely due to the larger volume of export tonnage reported, 10,285 tons, and the prospects of moving an appreciable tonnage of zinc into the government stockpile. Export demand during the week was reported to have been rather light, but prices are reported firm at 8.875¢ to 10.00¢ for prime western and 10.50¢ for high grade, f. a. s. Gulf Ports. In the domestic market, depleted inventories are being replenished and current orders are in good volume.

Lead

• • • **Producers** are optimistic about the last quarter volume of business and expect it to exceed third quarter shipments. All producers are selling for November delivery, and most report being sold out for October. The export price continues at 14.25¢ f. a. s. Gulf Ports. Although it is believed by market observers that little lead has so far been offered for stockpiling, there is little doubt that the prospect will exert a long term stabilizing effect on the market.

Lead, Zinc Output Drops

Toronto

• • • **Canadian production** of primary lead in June totaled 14,348 tons compared with 12,836 tons in May and with 15,313 tons in June 1946. For the first 6 months of this year, cumulative production of lead totaled 79,746 tons against 92,924 tons in the corresponding half of 1946.

Output of primary zinc in June amounted to 17,907 tons compared with 17,971 tons in May and with 19,473 tons in June 1946. In the first half of this year production of zinc totaled 104,557 tons as compared with 122,130 tons in the like period last year.

Nonferrous Metals Prices

Cents per pound

	Oct. 8	Oct. 9	Oct. 10	Oct. 11	Oct. 13	Oct. 14
Copper, electro, Conn.	21.50	21.50	21.50	21.50	21.50	21.50
Copper, Lake, Conn.	21.625	21.625	21.625	21.625	21.625	21.625
Tin, Straits, New York	80.00	80.00	80.00	80.00	80.00	80.00
Zinc, East St. Louis	10.50	10.50	10.50	10.50	10.50	10.50
Lead, St. Louis	14.80	14.80	14.80	14.80	14.80	14.80

New Pricing on Extrusions

Louisville, Ky.

• • • **A new method** of pricing aluminum extruded shapes has been announced by the Reynolds Metals Co. which is said by the company to make possible savings of significant proportion on the heavier shapes. The new method involves a complete departure from the standard method of pricing aluminum extrusions by means of a shape factor in which the perimeter of the shape is divided by the weight per lineal foot. According to information contained in the announcement there will be no Reynolds published shape prices and it will be necessary to obtain a quotation on each shape requirement.

According to Reynolds, price reductions on heavier extruded shapes weighing 0.25 lb per ft and up may amount to as much as 4¢ or 5¢ per lb or a percentage decrease of approximately 8 to 10 pct. This pricing arrangement, it is said, should eliminate many of the inequities of the factor system, which is based on an average rather than being figured on the manufacturing difficulties of the specific shape. The Reynolds' price formula evolves around the two factors of weight per lineal foot and intricacy of the shape.

Coupled with the announcement of this pricing plan was the statement that die charges for solid-shape extrusion dies and for rod and bar extrusion dies would be absorbed by Reynolds after certain minimum shipments of metal are made from such dies.

Dow Expands Sheet Sizes

Midland, Mich.

• • • **The Dow Chemical Co.** has announced that commercial and specification grade sheet will now be furnished in 48 in. x 144 in. and standard increments thereof in standard gages from 0.051 in. to 0.025 in. as well as previously published heavier gages. In addition, 36 in. x 120 in. sheets and standard increments of that size will be available in 0.025 in. gage.

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, f.o.b. shipping point, freight allowed	15.00
Aluminum pig, f.o.b. shipping point	14.00
Antimony, American Laredo Tex.	33.00
Beryllium copper, 3.75-4.25% Be; dollars per lb contained Be	$17.00
Beryllium aluminum 5% Be, dollars per lb contained Be	$35.50
Cadmium, del'd	$1.75
Cobalt, 97-99% (per lb)	$1.65 to $1.72
Copper electro, Conn. Valley	21.50
Copper, lake, Conn. Valley	21.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$80 to $90
Lead, St. Louis	14.80
Lead, New York	15.00
Magnesium, 99.8+%	20.50
Magnesium, sticks, carlots	36.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$81 to $83
Nickel, electro, f.o.b. New York	37.67
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$59 to $62
Silver, New York, cents per oz.	71.375
Tin, Straits, New York	80.00
Zinc, East St. Louis	10.50
Zinc, New York	11.005
Zirconium copper, 6 pct Zr. per lb contained Zr	$8.75

Remelted Metals

Brass Ingot

(Cents per lb, in carloads)

85-5-5-5 ingot	
No 115	17.50-18.00
No. 120	17.00-17.50
No. 123	16.50-17.00
80-10-10 ingot	
No. 305	21.50-22.00
No. 215	19.50-20.00
88-10-2 ingot	
No. 210	27.25-27.75
No. 215	25.75-26.25
No. 245	19.75-20.25
Yellow ingot	
No. 405	13.75-14.50
Manganese Bronze	
No. 421	15.75-16.50

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys:	
0.30 copper, max.	15.75
0.60 copper, max.	15.50
Piston alloys (No. 122 type)	14.25
No. 12 alum. (No. 2 grade)	13.75
108 alloy	14.00
195 alloy	14.75
AXS-679	14.25
Steel deoxidizing aluminum, notch-bar, granulated or shot	
Grade 1—95 pct-97½ pct	14.50
Grade 2—92 pct-95 pct	12.75
Grade 3—90 pct-92 pct	12.00-12.25
Grade 4—85 pct-90 pct	11.50-11.75

Electroplating Supplies

Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	37⅝
Electrodeposited	32.34
Rolled, oval, straight, delivered	32.59
Brass, 80-20, frt allowed	
Cast, oval, 15 in. or longer	33⅝
Zinc, Cast, 99.99	18¾
Nickel, 99 pct plus, frt allowed	
cast	51
Rolled, depolarized	52
Silver 999 fine	
Rolled, 1000 oz. lots, per troy oz.	67¼

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	43.00
Copper sulphate, 99.5, crystals, bbls	11.50
Nickel salts, single, 425 lb bbls, frt allowed	14.50
Silver cyanide, 100 oz. lots, per oz.	54.00
Sodium cyanide, 96 pct, domestic, 200 lb drums	15.00
Zinc cyanide, 100 lb drums	34.00
Zinc, sulphate, 89 pct, crystals, bbls, frt allowed	7.75

Mill Products

Aluminum

(Cents per lb, base, subject to extras for quantity, gage, size, temper and finish)

Drawn tubing: 2 to 3 in. OD by 0.065 in. wall; 3S, 43.5¢; 52S-O, 67¢; 24S-T, 71¢; base, 30,000 lb.

Plate: ¼ in. and heavier: 2S, 3S, 21.2¢; 52S, 24.2¢; 61S, 23.8¢; 24S, 24S-AL, 24.2¢; 75S, 75S-AL, 30.5¢; base, 30,000 lb.

Flat Sheet: 0.136-in. thickness: 2S, 3S, 23.7¢; 52S, 27.2¢; 61S, 24.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢; base, 30,000 lb.

Extruded Solid Shapes: factor determined by dividing the perimeter of the shape by its weight per foot. For factor 1 through 4, 3S, 26¢; 14S, 32.5¢; 24S, 35¢; 53S, 61S, 28¢; 63S, 27¢; 75S 45.5¢; base, 30,000 lb.

Wire, Rod and Bar: screw machine stock, rounds, 17S-T, ¼ in., 29.5¢; ½ in., 37.5¢; 1 in., 26¢; 2 in., 24.5¢; hexagons, ¼ in., 35.5¢; ½ in., 30¢; 1 in., 2 in., 27¢; base, 5000 lb. *Rod:* 2S, 3S, 1¼ to 2½ in. diam. rolled, 23¢; cold-finished, 23.5¢ base, 30,000 lb. *Round Wire:* drawn, coiled, B & S gage 17-18; 2S, 3S, 33.5¢; 56S, 39.5¢; 10,000 lb base. B & S gage 00-1: 2S, 3S, 21¢; 56S, 30.5¢. B & S 15-16; 2S, 3S, 32.5¢; 56S, 38¢; base, 30,000 lb.

Magnesium

(Cents per lb f.o.b. mill. Base quantity 30,000 lb.)

Sheet and Plate: Ma. FSa. ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 14, 69¢-74¢; 16, 79¢-81¢; 18, 87¢-89¢; 22, $1.25-$1.31; 24, $1.71-$1.75.

Round Rod: M, diam, in., ¼ to ⅜, 47¢; ½ to ¾, 45¢ 1¼ to 2½, 43.5¢; 3½ to 5, 42.5¢. Other alloys higher.

Square, Hexagonal Bar: M, size across flats, in., ¼ to ⅜, 52.5¢; ½ to ¾, 47.5¢; 1¼ to 2½, 45¢; 3½ to 5, 44¢. Other alloys higher.

Solid Shapes, Rectangles: M, form factors, 1 to 4, 46¢; 11 to 13, 49¢; 20 to 22, 51.5¢; 29 to 31, 59.5¢; 38 to 40, 75.5¢; 47 to 49, 98¢. Other alloys higher.

Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ to 5/16, $1.21; 5/16 to ⅜, $1.12; ⅜ to 7/16, 97¢; 0.058 to 0.064, 7/16 to ½, 89¢; ½ to ⅝, 81¢; 0.065 to 0.082, ⅝ to ¾, 76¢; ¾ to 1, 72¢; 0.083 to 0.108, 1 to 2, 68¢; 0.165 to 0.219, 2 to 3, 59¢; 3 to 4, 57¢. Other alloys higher.

Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	54	43
No. 35 sheets	..	41
Strip, cold-rolled	60	44
Rod		
Hot-rolled	50	39
Cold-drawn	55	44
Angles, hot-rolled	50	39
Plates	52	41
Seamless tubes	83	71
Shot and blocks	..	31

Zinc

(Cents per lb, f.o.b. mill)

Sheet, l.c.l.	15.50
Ribbon, ton lots	14.50
Plates	
Small	13.50
Large, over 12 in.	14.50

Copper, Brass, Bronze

(Cents per pound, f.o.b. mill effective June 11)

	Extruded Shapes	Rods	Sheets
Copper	33.53	....	33.68
Copper, hot-rolled	....	30.03	....
Copper, drawn	....	31.03	....
Low brass	34.04*	31.07	31.38
Yellow brass	32.39*	29.32	29.63
Red brass	34.65*	31.68	31.99
Naval brass	29.56	28.31	34.25
Leaded brass	27.98	24.39	30.13
Commercial bronze	35.52*	32.80	33.11
Manganese bronze	33.14	31.64	37.75
Phosphor bronze, 5 pct.	53.25*	52.25	52.00
Muntz metal	29.17	27.92	32.36
Everdur, Herculoy, Olympic, etc.	37.07	35.57	38.44
Nickel silver, 5 pct.	41.20	40.28	38.67
Architectural bronze	27.94	....	....

*Seamless tubing.

Scrap Metals

(Dealers' buying prices, f.o.b. New York in cents per pound.)

Brass Mill Scrap

(Lots of less than 15,000 lb.)

Cartridge brass turnings	14½
Loose yellow brass trimmings	15½

Copper and Brass

No. 1 heavy copper and wire	15½—16
No. 2 heavy copper and wire	14½—15
Light copper	13 —13½
Auto radiators (unsweated)	8½— 9
No. 1 composition	10½—11
No. 1 composition turnings	10 —10½
Clean red car boxes	9 — 9½
Cocks and faucets	8½— 9
Mixed heavy yellow brass	6½— 7
Old rolled brass	7 — 7¼
Brass pipe	8 — 8½
New soft brass clippings	11 —11½
Brass rod ends	8½— 9
No. 1 brass rod turnings	8 — 8½

Aluminum

Alum. pistons free of struts	3½— 4
Aluminum crankcases	5½— 6
2S aluminum clippings	8 — 8½
Old sheet & utensils	5½— 6
Mixed borings and turnings	— 2
Misc. cast aluminum	5 — 5½
Dural clips (24S)	4½— 5

Zinc

New zinc clippings	5½— 6
Old zinc	4¼— 4½
Zinc routings	2½— 3
Old die cast scrap	2½— 3

Nickel and Monel

Pure nickel clippings	15½—17½
Clean nickel turnings	14 —15
Nickel anodes	16 —17
Nickel rod ends	16 —17
New Monel clippings	12 —13
Clean Monel turnings	7 — 8
Old sheet Monel	10 —10½
Old Monel castings	7½— 8
Inconel clippings	8 — 8½
Nickel silver clippings, mixed	7½— 8
Nickel silver turnings, mixed	5½— 6

Lead

Soft scrap lead	10 —10½
Battery plates (dry)	5 — 5½

Magnesium Alloys

Segregated solids	6½— 7
Castings	4½— 5½

Miscellaneous

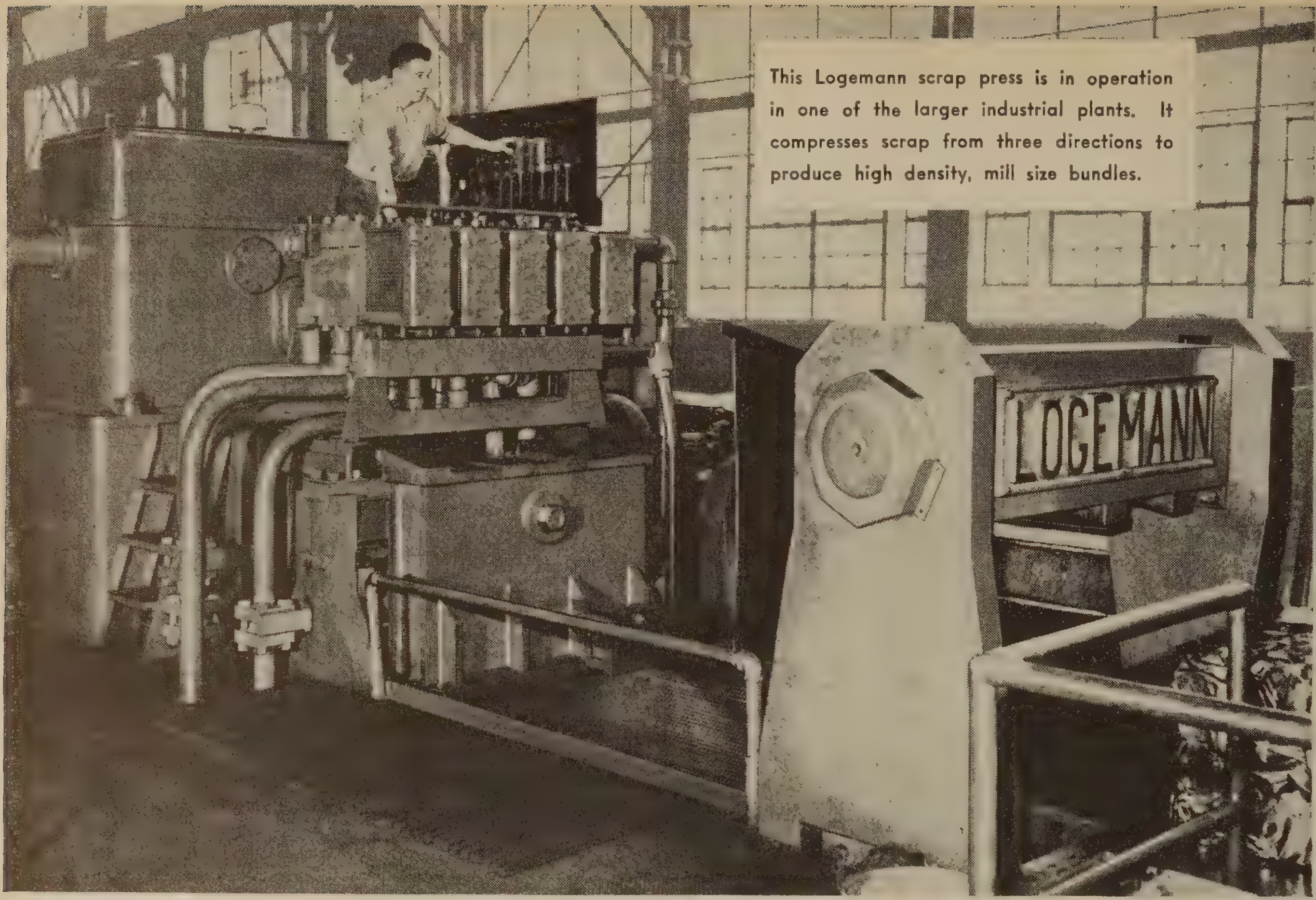
Block tin	63 —65
No. 1 pewter	48 —50
No. 1 auto babbitt	38 —40
Mixed common babbitt	11½—12
Solder joints	13 —13½
Siphon tops	38 —39
Small foundry type	13 —13½
Monotype	12 —12½
Lino and stereotype	11½—12
Electrotype	9½—10
New type shell cuttings	11 —11½
Clean hand picked type shells	4½— 5
Lino and stereo dross	5 — 5½
Electro dross	3 — 3¼

Lead Products

(Cents per lb)

F.o.b. shipping point freight collect Freight equalized with nearest free delivery point.

Full lead sheets	18.25
Cut lead sheets	18.75
Lead pipe, manufacturing point	17.50
Lead traps and bends	List +42%
Combination lead and iron bends and ferrules, also combination lead and iron ferrules	List +42%
Lead wool	19.50



This Logemann scrap press is in operation in one of the larger industrial plants. It compresses scrap from three directions to produce high density, mill size bundles.

Self-contained ......
Triple Compression ..
Automatically Controlled

LOGEMANN SCRAP PRESSES

handle high tonnages with minimum labor . . . *at low cost!*

●

LOGEMANN METAL BALERS

. . . are built in a large range of sizes to meet specific conditions. Let Logemann's engineering service help you arrive at the most efficient and economical way of handling your scrap.

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The compact unit illustrated is completely self-contained with oil tank and pump located directly over the press . . . utilizing the advantages of short pipe lines. Automatic controls, mounted in front of pump, give the operator full visibility at all times. Controls operate rams successively within a single rigid box. There is no complex construction which means there is *no need for specially-trained maintenance crews.*

Both two-ram and three-ram models are available with automatic controls or for manual manipulation.

Logemann Bros. Co. have specialized in the production of scrap metal presses for sheet mills, stamping plants, scrap yards, and metal manufacturing plants of all types for nearly 75 years. Write for full information—please state the nature of your scrap and tonnage.

LOGEMANN BROTHERS COMPANY
3164 W. Burleigh Street ● Milwaukee 10, Wisconsin

Heavy Melting Moves Up Sharply

New York

• • • The Iron Age scrap composite price moved up $1.42 per ton on the basis of a $2.00 increase in Philadelphia and a $2.25 increase in Pittsburgh. The increases in steel scrap prices at Pittsburgh and Philadelphia were bound to come according to many sources. In recent weeks the consumer sales made at the then quoted prices did not give the market its real test. When all the older orders at higher than $42 and $44 a ton were cleaned out of the market then the real test came to the sales that were made at the lower figures.

Although many large consumers had stayed out of the market in order not to pay the higher prices, it now appears that this action had little to do with the underlying tone of the market. Brokers at Pittsburgh are already taking it on the chin because they are not able to cover the $38 orders at less than $40 a ton. Not only has the strong undertone appeared at Pittsburgh, and Philadelphia, but at other points the market is poised as well.

For further scrap news see p. 184.

Increases have not been made in Chicago, although railroad specialties in that market continue their slow increase of recent weeks. Although the undertone in the Detroit market has been very firm, no increases in heavy melting grades has been noted. The general increase in the tonnages of low phos material being shipped in most markets continues unabated.

•

PITTSBURGH—The firm undertone obvious in this market during the past few weeks has been transferred to higher quotations across the board. In view of the fact that brokers are now paying $40 to cover $38 orders for heavy melting steel, these grades are now quotable at $40 to $40.50. There has also been an increase in the price and the quantity of material coming in from out of the district and freight rate increases effected Oct. 13 have boosted freight charges substantially—more than 72¢ in the case of shipments from New York. Some material bought as good No. 1 heavy melting steel in the East is being sold here as low phos though the price is not up to the $45 to $46 being quoted for 3-ft low phos. Railroad grades, except for heavy melting are up 50¢ based on the latest awards.

•

CHICAGO—Price increases were expected at any moment early last week. For the most part the dealers have cleaned up their orders and are willing to listen to new prices, provided they are high enough. Railroad specialties continue to inch higher and were considered by many as indicative of the price level the mills will have to meet to obtain any decent tonnages of openhearth scrap.

•

CLEVELAND—Scrap prices and market conditions are practically unchanged since last week. Shipments are poor and mills are getting very little scrap. In the valley, a major consumer bought some low phos at $46.50. There are a large number of private deals on, but few dealers are getting much scrap unless their buying prices are high. At this stage of the game, all signs point to a higher market, but it is equally certain that mills will hold to the bitter end before buying, or Oct. 23 or thereabouts.

•

BOSTON—Heavy steel generally is $31.50 to $32.50 with an occasional sale at $33. Pittsburgh bid $34.50 but immediately withdrew on an announcement of the freight rate increase. Turnings and borings are 50¢ higher with supplies shrinking. Cast supply is on the up and demand slipping. Malleable is in urgent demand and scarce with small lots moving at around $45 per ton. The overall scrap market is quiet.

•

PHILADELPHIA—There was a mill purchase of heavy melting scrap at $40 here last week. Brokers are reported to have been paying $39 for the past week and a half and more recently as much as $39.50 has been paid. The turnings market is quoted at $32 to $33 this week based on higher prices paid by consumers. Cast grades prices are also higher. Low phos is quoted at $44 to $45; electric furnace bundles at $42 to $43. Mill shipments are reported to be fair.

•

NEW YORK—Heavy steel grades went up $1 per ton again for the third successive week to a top of $35 per ton. Cast grades also continued their rise and are now at a $42 top. There was still no surge of new shipments with the introduction of the new price, and scrap remained very tight.

•

DETROIT—The Detroit price line is being held—but with considerable difficulty. Informed sources here agree that considerable pressure has gathered under the present price level and the fact that Chrysler and Briggs will be down this week will tend to increase existing pressures by limiting the available supply. Cast grades are very strong with some foundry buyers reporting a price of $45 per net ton for clean selected scrap.

•

The action of steel mills in making purchases on the basis of Chicago prices which had the effect of cutting No. 2 heavy melting steel to $35.23 resulted in shutting off shipments to the mills as brokers were unwilling to accept orders at that price and were paying more and shipping elsewhere. Foundry grades were stronger and higher.

•

BUFFALO—Additional sales at $38 during the past week seemed to have killed off any prospects of higher prices for steelmaking scrap during October. Mills probably are in the best fall inventory position in years. One of the leaders, out of the market for the past 2 months, has maintained a good stock pile by using a high iron charge. Another major consumer has built up its reserves with the aid of so-called remote scrap, including heavy shipments by canal from New York. Scrap from the Hudson Valley that might ordinarily come to Buffalo was reported going into eastern Pennsylvania. Foundry and electric furnace grades were strong at unchanged prices.

•

BIRMINGHAM—Despite heavy pressure from scrap producers and dealers with resultant strong undertone, prices in this market are unchanged for another week. Although mills have so far been able to obtain supplies, receipts at dealers' yards have fallen off sharply. Movement of agricultural scrap still is extremely light and there is a disinclination to turn loose much industrial scrap until the price situation is clarified.

•

TORONTO—While some improvement of scrap iron and steel offerings followed the recent price advances, the increase in supply as a whole has not met with the success that was anticipated in government circles. Local dealers state that receipts of some lines of scrap have picked up, but incoming materials are still less than 35 pct of consumer requirements. No. 1 steel scrap is one of the tight items and most of this is coming from industrial plants. However, secondary grades of steel scrap have gained in supply recently. Imports of steel scrap are said to be gaining momentum and mills are depending on imports for winter needs. Cast scrap, which is commanding about the same prices as pig iron, namely $38 to $40 per gross ton delivered consumer plants, continues scarce and brisk bidding is reported for sizable tonnages.

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	$40.00 to $40.50
RR. hvy. melting	41.50 to 42.00
No. 2 hvy. melting	40.00 to 40.50
RR. scrap rails	46.50 to 47.50
Rails 2 ft. and under	49.00 to 50.00
No. 1 comp'd bundles	40.00 to 40.50
Hand bdld. new shts.	40.00 to 40.50
Hvy. axle turn.	37.50 to 38.00
Hvy. steel forge turn.	37.50 to 38.00
Mach. shop turn.	33.50 to 34.00
Shoveling turn.	34.50 to 35.50
Mixed bor. and turn.	33.50 to 34.00
Cast iron borings	33.50 to 34.50
No. 1 cupola cast.	44.00 to 44.50
Hvy. breakable cast.	38.00 to 38.50
Malleable	53.00 to 55.00
RR. knuck. and coup.	48.50 to 49.50
RR. coil springs	48.50 to 49.50
RR. leaf springs	48.50 to 49.50
Rolled steel wheels	48.50 to 49.50
Low phos.	45.00 to 46.00

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	**$38.50 to $39.00**
No. 2 hvy. melting	**38.50 to 39.00**
No. 1 bundles	**38.50 to 39.00**
No. 2 dealers' bundles	**38.50 to 39.00**
Bundled mach. shop turn.	**38.50 to 39.00**
Galv. bundles	**36.50 to 37.00**
Mach. shop turn.	**33.50 to 34.00**
Short shov. turn.	38.00 to 38.50
Cast iron borings	36.00 to 36.50
Mix. borings & turn.	**33.50 to 34.00**
Low phos, hvy. forge	46.00 to 46.50
Low phos, plates	42.50 to 43.50
No. 1 RR. hvy. melt.	44.00 to 45.00
Rerolling rails	53.00 to 54.00
Miscellaneous rails	48.00 to 49.00
Angles & splice bars	49.50 to 50.00
Locomotive tires, cut	47.00 to 48.00
Cut bolster & side frames	47.00 to 48.00
Standard stl. car axles	54.00 to 55.00
No. 3 steel wheels	47.00 to 47.50
Couplers & knuckles	47.00 to 48.00
Rails 2 ft. and under	52.00 to 54.00
Malleable	62.00 to 63.00
No. 1 mach. cast.	49.00 to 51.00
No. 1 agricul. cast.	47.00 to 48.00
Hvy. breakable cast.	**40.00 to 41.00**
RR. grate bars	**43.50 to 44.00**
Cast iron brake shoes	45.00 to 45.50
Cast iron carwheels	45.00 to 45.50

CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 bundles	39.00 to 40.00
No. 2 bundles	39.00 to 40.00
Mach. shop turn.	29.50 to 30.00
Shoveling turn.	31.50 to 32.00
Cast iron borings	29.50 to 30.00
Mixed bor. & turn.	29.00 to 30.00
Low phos. plate	40.00 to 41.00
No. 1 cupola cast.	45.00 to 46.00
Hvy. breakable cast.	36.00 to 37.00
Scrap rails	40.00 to 41.00

BOSTON

Dealers' buying prices per gross ton, f.o.b. cars:

No. 1 hvy. melting	$31.50 to $33.00
No. 2 hvy. melting	31.50 to 32.50
Nos. 1 and 2 bundles	31.50 to 32.50
Busheling	31.50 to 32.50
Shoveling turn.	28.00 to 28.50
Machine shop turn.	27.00 to 27.25
Mixed bor. & turn.	27.00 to 27.25
Cl'n cast. chem. bor.	28.00 to 29.00
No. 1 machinery cast	38.00 to 40.00
No. 2 machinery cast.	36.00 to 39.00
Heavy breakable cast	38.00 to 39.00
Stove plate	36.00 to 37.00

DETROIT

Per gross ton, brokers' buying prices, f.o.b. cars:

No. 1 hvy. melting	$34.25 to $35.25
No. 2 hvy. melting	34.25 to 35.25
No. 1 bundles	34.25 to 35.25
New busheling	34.25 to 35.25
Flashings	34.25 to 35.25
Mach. shop turn.	**27.00 to 28.00**
Shoveling turn.	**28.00 to 29.00**
Cast iron borings	**28.00 to 29.00**
Mixed bor. & turn.	**28.00 to 29.00**
Low phos. plate	38.25 to 39.25
No. 1 cupola cast	43.00 to 44.00
Hvy. breakable cast	33.00 to 34.00
Stove plate	**32.00 to 34.00**
Automotive cast.	43.00 to 44.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 bundles	39.00 to 40.00
No. 2 bundles	39.00 to 40.00
Mach. shop turn.	32.00 to 33.00
Shoveling turn.	32.00 to 33.00
Mixed bor. & turn.	32.00 to 33.00
Clean cast chemical bor.	35.00 to 36.50
No. 1 machinery cast.	49.00 to 50.00
No. 1 mixed yard cast.	47.00 to 48.00
Hvy. breakable cast.	47.00 to 48.00
Cast. charging box	47.00 to 48.00
Clean auto cast.	47.00 to 48.00
Hvy. axle forge turn.	40.00 to 41.00
Low phos. plate	44.00 to 45.00
Low phos. punchings	44.00 to 45.00
Low phos. bundles	42.00 to 43.00
RR. steel whels	47.00 to 48.00
RR. coil springs	47.00 to 48.00
RR. malleable	58.00 to 60.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	**$40.00 to $41.00**
No. 2 hvy. melting	35.23
Bundled sheets	35.23
Mach. shop turn.	26.00 to 27.00
Locomotive tires, uncut	**42.00 to 43.00**
Mis. std. sec. rails	**43.00 to 44.00**
Rerolling rails	**46.50 to 47.50**
Steel angle bars	**44.00 to 45.00**
Rails 3 ft. and under	**46.00 to 47.00**
RR. steel springs	**45.00 to 46.00**
Steel car axles	45.00 to 46.00
Grate bars	**37.00 to 38.00**
Brake shoes	39.00 to 40.00
Malleable	**59.00 to 61.00**
Cast iron car wheels	**42.50 to 43.50**
No. 1 machinery cast	**43.00 to 44.00**
Hvy. breakable cast	**38.00 to 39.00**

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	34.00 to 35.00
No. 2 bundles	34.00 to 35.00
No. 1 busheling	34.00 to 35.00
Long turnings	23.00 to 24.00
Shoveling turnings	**25.00 to 26.00**
Cast iron borings	24.00 to 25.00
Bar crops and plate	38.00 to 38.50
Structural and plate	38.00 to 38.50
No. 1 cupola cast.	44.00 to 45.00
Stove plate	42.00 to 42.50
No. 1 RR. hvy. melt.	36.00 to 37.00
Steel axles	38.00 to 39.00
Scrap rails	37.50 to 38.00
Rerolling rails	41.00 to 42.00
Angles & splice bars	40.00 to 41.00
Rails 3 ft. & under	40.00 to 41.00
Cast iron carwheels	35.00 to 36.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	**$39.50 to $40.00**
No. 2 hvy. melting	**39.50 to 40.00**
Mach. shop turn.	**33.00 to 34.00**
Short shov. turn.	**34.00 to 35.00**
Cast iron borings	**33.00 to 34.00**
Low phos	46.00 to 46.50

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	34.00 to 35.00
No. 2 bundles	34.00 to 35.00
Comp. galv. bundles	31.00 to 32.00
Mach. shop turn.	27.50 to 28.50
Mixed bor. & turn.	27.50 to 28.50
Shoveling turn.	29.00 to 30.00
No. 1 cupola cast.	41.00 to 42.00
Hvy. breakable cast.	41.00 to 42.00
Charging box cast.	41.00 to 42.00
Stove plate	41.00 to 42.00
Clean auto cast.	41.00 to 42.00
Unstrip. motor blks.	37.50 to 38.50
Cl'n chem. cast bor.	28.50 to 29.00

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	**$37.00 to $38.00**
No. 2 hvy. melting	**37.00 to 38.00**
No. 1 bundles	**37.00 to 38.00**
No. 2 bundles	**37.00 to 38.00**
No. 1 busheling	**37.00 to 38.00**
Mach. shop turn.	29.00 to 30.00
Shoveling turn.	31.00 to 32.00
Cast iron borings	29.00 to 30.00
Mixed bor. & turn.	29.00 to 30.00
No. 1 cupola cast.	40.00 to 42.00
Charging box cast.	36.00 to 38.00
Stove plate	39.00 to 40.00
Clean auto cast.	40.00 to 42.00
Small indl. malleable	39.00 to 41.00
RR. malleable	50.00 to 55.00
Low phos. plate	42.50 to 43.50
Scrap rails	40.00 to 41.00
Rails 3 ft. & under	45.00 to 46.00
RR. steel wheels	46.00 to 48.00
Cast iron carwhels	46.00 to 48.00
RR. coil & leaf spgs.	46.00 to 48.00
RR. knuckles & coup.	46.00 to 48.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	**$38.00 to $38.50**
No. 2 hvy. melting	**38.00 to 38.50**
No. 1 bundles	**38.00 to 38.50**
No. 2 bundles	**38.00 to 38.50**
No. 1 busheling	**38.00 to 38.50**
Drop forge flashings	**38.00 to 38.50**
Mach. shop turn.	**31.50 to 32.00**
Shoveling turn.	**32.50 to 33.00**
Steel axle turn.	**38.00 to 38.50**
Cast iron borings	**32.50 to 33.00**
Mixed bor. & turn.	**32.50 to 33.00**
Low phos.	43.00 to 43.50
No. 1 machinery cast.	**47.00 to 47.50**
Malleable	55.00 to 60.00
RR. Cast.	**47.00 to 47.50**
Railroad grate bars	**42.00 to 44.00**
Stove plate	**42.00 to 44.00**
RR. hvy. melting	**40.50 to 41.00**
Rails 3 ft. & under	**47.00 to 48.00**
Rails 18 in. & under	**48.00 to 49.00**

SAN FRANCISCO

Per gross ton f.o.b. shipping point

No. 1 hvy. melting	**$22.00**
No. 2 hvy. melting	**22.00**
No. 2 bales	**22.00**

Per gross ton delivered to consumer

No. 3 bales	**$16.50**
Mach. shop turn.	**13.00**
Elec. furn. 1 ft. und.	26.00
No. 1 cupola cast.	**$32.00 to 33.00**
RR. hvy. melting	23.00

LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting	**$22.50**
No. 2 hvy. melting	**22.50**
No. 1 bales	**22.50**
No. 2 bales	**22.50**
No. 3 bales	**16.00**
Mach. shop turn.	**14.50**
No. 1 cupola cast.	**$32.00 to 33.00**
RR. hvy. melting	**23.00**

SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy, melt.	**$22.00 to $24.00**
Elec. furn. 1 ft. and und.	**27.00 to 28.50**
No. 1 cupola cast.	30.00
RR. hvy. melting	**23.00 to 25.00**

HAMILTON, ONT.

Per gross ton delivered to consumer:

Cast grades f.o.b. shipping point

Heavy melting	$22.00*
No. 1 bundles	22.00*
No. 2 bundles	21.50*
Mechanical bundles	20.00*
Mixed steel scrap	19.00*
Mixed borings and turnings	17.00*
Rails, remelting	23.00*
Rails, rerolling	26.00*
Bushelings	17.00*
Bushelings, new fact., prep'd	21.00*
Bushelings, new fact., unprep'd	16.00*
Short steel turnings	17.00*
No. 1 cast.	36.00 to 40.00

*Ceiling Price.

Comparison of Prices . .

Advances over past week in Heavy Type, declines in *Italics*. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables.

Flat-Rolled Steel: (cents per pound)	Oct. 14, 1947	Oct. 7, 1947	Sept. 16, 1947	Oct. 15, 1946
Hot-rolled sheets	2.80	2.80	2.80	2.425
Cold-rolled sheets	3.55	3.55	3.55	3.275
Galvanized sheets (10 ga.)	3.95	3.95	3.95	4.05*
Hot-rolled strip	2.80	2.80	2.80	2.45
Cold-rolled strip	3.55	3.55	3.55	3.05
Plates	2.95	2.95	2.95	2.50
Plates wrought iron	6.85	6.85	6.85	4.112
Stain's c-r strip (No. 302)	30.30	30.30	30.30	30.30

*24 gage

Tin and Terneplate: (dollars per base box)				
Tinplate, standard cokes	$5.75	$5.75	$5.75	$5.00
Tinplate, electro (0.50 lb)	5.05	5.05	5.05	4.50
Special coated mfg. ternes	4.90	4.90	4.90	4.30

Bars and Shapes: (cents per pound)				
Merchant bars	2.90	2.90	2.90	2.50
Cold-finished bars	3.55	3.55	3.55	3.10
Alloy bars	3.30	3.30	3.30	2.92
Structural shapes	2.80	2.80	2.80	2.35
Stainless bars (No. 302)	26.00	26.00	26.00	25.97
Wrought iron bars	7.15	7.15	7.15	4.76

Wire and Wire Products: (cents per pound)				
Bright wire	3.55	3.55	3.55	3.05
Wire nails	4.25	4.25	4.25	3.75

Rails: (dollars per 100 lb)				
Heavy rails	$2.75	$2.75	$2.75	$43.39*
Light rails	3.10	3.10	3.10	49.18*

*per net ton

Semifinished Steel: (dollars per gross ton)				
Rerolling billets	$45.00	$45.00	$45.00	$39.00
Sheet bars	66.00	66.00	66.00	38.00
Slabs, rerolling	45.00	45.00	45.00	39.00
Forging Billets	55.00	55.00	55.00	47.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	58.43

Wire Rods and Skelp: (cents per pound)				
Wire rods	2.80	2.80	2.80	2.30
Skelp	2.60	2.60	2.60	2.05

Pig Iron: (per gross ton)	Oct. 14, 1947	Oct. 7, 1947	Sept. 16, 1947	Oct. 15, 1946
No. 2, foundry, Phila.	$41.36	$41.22	$41.22	$30.43
No. 2, Valley furnace	36.50	36.50	36.50	28.50
No. 2, Southern Cin'ti	40.24	39.75	39.75	27.80
No. 2, Birmingham	34.88	34.88	34.88	24.88
No. 2, foundry, Chicago†	36.00	36.00	36.00	28.50
Basic del'd Philadelphia	40.86	40.72	40.72	29.93
Basic, Valley furnace	36.00	36.00	36.00	28.00
Malleable, Chicago†	36.50	36.50	36.50	28.50
Malleable, Valley	36.50	36.50	36.50	28.50
Charcoal, Chicago	49.49	49.49	49.49	42.34
Ferromanganese‡	135.00	135.00	135.00	135.00

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† The switching charge for delivery to foundries in the Chicago district is $1 per ton.

‡ For carlots at seaboard.

Scrap: (per gross ton)				
Heavy melt'g steel, P'gh	$40.25	$38.00	$37.75	$20.00
Heavy melt'g steel, Phila.	39.50	37.50	36.75	18.75
Heavy melt'g steel, Ch'go	38.75	38.75	38.75	18.75
No. 1, hy. comp. sheet, Det.	34.50	34.50	34.50	17.32
Low phos. Youngs'n	46.25	44.50	44.50	22.50
No. 1, cast, Pittsburgh	44.25	43.00	43.00	25.00
No. 1, cast, Philadelphia	49.50	47.50	47.00	25.00
No. 1, cast, Chicago	50.00	49.50	49.50	25.00

Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$12.50	$12.00	$12.00	$8.75
Foundry coke, prompt	14.00	13.75	13.75	8.50

Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro., Conn.	21.50	21.50	21.50	14.375
Copper, Lake, Conn.	21.625	21.625	21.625	14.375
Tin, Straits, New York	80.00	80.00	80.00	52.00
Zinc, East St. Louis	10.50	10.50	10.50	9.25
Lead, St. Louis	14.80	14.80	14.80	8.10
Aluminum, virgin	15.00	15.00	15.00	15.00
Nickel, electrolytic	37.67	37.67	37.67	35.00
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	33.00	33.00	33.00	14.50

Composite Prices . .

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942, and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite price for the current quarter is an estimate based on finished steel shipments for the previous quarter. This figure will be revised when shipments for this quarter are compiled.

	FINISHED STEEL	PIG IRON	SCRAP STEEL
Oct. 14, 1947	3.19141¢ per lb.	$36.96 per gross ton	$39.50 per gross ton
One week ago	3.19141¢ per lb.	$36.93 per gross ton	$38.08 per gross ton
One month ago	3.19141¢ per lb.	$36.93 per gross ton	$37.75 per gross ton
One year ago	2.73011¢ per lb.	$28.13 per gross ton	$19.17 per gross ton

	HIGH	LOW	HIGH	LOW	HIGH	LOW
1947	3.19141¢ Aug. 5	2.87118¢ Jan. 7	$37.35 Aug. 19	$30.14 Jan. 7	$41.67 Aug. 5	$29.50 May 20
1946	2.83599¢ Dec. 31	2.54490¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
1945	2.44104¢ Oct. 2	2.38444¢ Jan. 2	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944	2.30837¢ Sept. 5	2.21189¢ Oct. 5	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.29176¢	2.29176¢	23.61	23.61	$19.17	$19.17
1942	2.28249¢	2.28249¢	23.61	23.61	19.17	19.17
1941	2.43078¢	2.43078¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1934	2.15367¢ Apr. 24	1.95757¢ Jan. 2	17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Sept. 25
1933	1.95578¢ Oct. 3	1.75836¢ May 2	16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Jan. 3
1932	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1931	1.99626¢ Jan. 13	1.86586¢ Dec. 29	15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 Dec. 29
1930	2.25488¢ Jan. 7	1.97319¢ Dec. 9	18.21 Jan. 7	15.90 Dec. 16	15.00 Feb. 18	11.25 Dec. 9
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. basing points in cents per pound or dollars per gross ton. Extras apply. Delivered prices do not reflect 3 pct tax on freight. Industry practice has discontinued arbitrary f.o.b. prices at Gulf and Pacific Ports. Space limitations prevent quotation of delivered prices at major ports. (1) Commercial quality sheet grade; primes, 25c above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producers to fabricators. (8) Also shafting. For quantities of 20,000 lb to 89,999 lb. (9) Carload lot in manufacturing trade. (10) Delivered Los Angeles only. (11) Boxed. (12) Produced to dimensional tolerances in AISI Manual Sec. 6. (13) Delivered San Francisco only: Includes 3 pct freight tax. (14) Delivered Kaiser Co. prices: includes 3 pct freight tax. (15) to 0.035 to 0.075 in. thick by ¾ to 3½ in. wide. (16) Spot market as high as $92 gross ton. (17) Delivered Los Angeles: add ½c per 100 lb for San Francisco. (18) Slab prices subject to negotiation in most cases. Some producers charge (19) $2 more, (21) $1 more. Some producers charge (22) 0.05¢ less, (23) 0.10¢ less, (24) 0.20¢ less.

													DELIVERED TO		
Basing Points	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio		San Franc'co, Los Angeles, Seattle	Detroit	New York	Philadelphia
INGOTS															
Carbon, rerolling					($36.00 f. o. b. mill) (Spot market as high as $80 gross ton)										
Carbon, forging	$46.00														
Alloy	$56.00									(Canton = $56.00)					
BILLETS, BLOOMS, SLABS															
Carbon, rerolling [18]	$45.00[19]	$45.00[19]	$45.00[19]	$47.00	$45.00[19]	$45.00[19]							$48.00[19]		
Carbon, forging billets	$55.00	$55.00	$55.00	$55.00	$55.00	$55.00							$58.00		
Alloy	$66.00	$66.00				$66.00	(Bethlehem, Massillon, Canton = $66.00)						$69.00		
SHEET BARS[16]							$66.00								
PIPE SKELP	2.60¢[21]	2.65¢					2.60¢[21]	2.60¢[21]							
WIRE RODS	2.80¢[21]	2.80¢[21]		2.80¢[21]	2.85¢		(Worcester = 2.90¢[21])					3.52¢[13]			
SHEETS															
Hot-rolled	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	3.175¢	(Ashland, Ky. = 2.80¢)		3.54[17]¢	2.95¢	3.12¢	3.02¢
Cold-rolled[1]	3.55¢	3.55¢	3.55¢	3.55¢		3.55¢	3.55¢		3.65¢	3.55¢			3.70¢	3.96¢	3.97¢
Galvanized (10 gage)	3.95¢[23]	3.95¢[23]	3.95¢[23]		3.95¢[23]		3.95¢	3.95¢	4.05¢	3.35¢	(Ashland = 3.95¢)	4.62¢[17]		4.27¢	4.17¢
Enameling (12 gage)	3.95¢[22]	3.95¢[22]	3.95¢[22]	3.95¢			3.95¢		4.05¢	3.95¢			4.10¢[22]	4.42¢	4.37¢
Long ternes [2] (10 gage)	4.05¢[24]	4.05¢[24]	3.85¢											4.52¢	4.47¢
STRIP															
Hot-rolled [3]	2.80¢	2.80¢	2.80¢	2.80¢[15]	2.80¢		2.80¢					3.60¢[17]	2.95¢	3.27¢	3.22¢
Cold-rolled [4]	3.55¢	3.65¢		3.55¢			3.55¢			(Worcester = 3.75¢)			3.70¢	4.02¢	3.97¢
Cooperage stock	3.10¢	3.10¢			3.10¢		3.10¢							3.57¢	
TINPLATE															
Standard cokes, base box	$5.75	$5.75	$5.75		$5.85			$5.85	$5.85		(Warren, Ohio = $5.75)			$6.217	$6.082[11]
Electro, box 0.25 lb. 0.50 lb. 0.75 lb.						Deduct 90¢ from standard coke base box price. Deduct 70¢ from standard coke base box price. Deduct 50¢ from standard coke base box price.									
BLACKPLATE, 29 gage[5]	3.90¢	3.90¢	3.90¢		4.00¢			4.00¢	4.00¢					4.32¢	4.22¢
BLACKPLATE, CANMAKING															
55 lb. to 70 lb.						Deduct $1.55 from standard coke base box.									
75 lb. to 95 lb.						Deduct $1.65 from standard coke base box.									
100 lb. to 118 lb.						Deduct $1.55 from standard coke base box.									
TERNES, MFG., Special coated						Deduct 85¢ from standard coke base box price.									
BARS															
Carbon steel	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢					3.625¢[17]	3.05¢	3.314	3.32¢
Rail steel[6]	Subject to negotiation because of fluctuating scrap prices.														
Reinforcing (billet)[7]	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢				3.325¢[17]		3.07¢	2.97¢
Reinforcing (rail)	Subject to negotiation because of fluctuating scrap prices.														
Cold-finished[8]	3.55¢	3.55¢	3.55¢	3.55¢		3.55¢							3.70¢	3.96¢	3.97¢
Alloy, hot-rolled	3.30¢	3.30¢				3.30¢	3.30¢	(Bethlehem, Massillon, Canton = 3.30¢)					3.45¢		3.45¢
Alloy, cold-drawn	4.10¢	4.10¢	4.10¢	4.10¢		4.10¢							4.25¢		
PLATE															
Carbon steel[12]	2.95¢	2.95¢	2.95¢	2.95¢	2.95¢		2.95¢	(Coatesville = 3.15¢, Claymont = 3.15¢, Geneva, Utah = 3.10¢) 2.95¢				3.76¢[14]		3.27¢	3.17¢
Floor plates	4.20¢	4.20¢												4.67¢	4.62¢
Alloy	3.80¢	3.80¢			(Coatesville = 4.50¢)									4.27¢	4.02¢
SHAPES, Structural	2.80¢	2.80¢	2.80¢		2.80¢	2.80¢	(Geneva, Utah = 3.95¢, Bethlehem = 2.80¢)					3.43¢[10]		3.02¢	2.95¢
SPRING STEEL, C-R															
0.08 to 0.40 carbon	3.55¢			3.55¢			(Worcester = 3.75¢)								
0.41 to 0.60 carbon	5.05¢			5.05¢			(Worcester = 5.25¢)								
0.61 to 0.80 carbon	5.65¢			5.65¢			(Worcester = 5.85¢)								
0.81 to 1.05 carbon	7.15¢			7.15¢			(Worcester = 7.35¢)								
1.06 to 1.35 carbon	9.45¢			9.45¢			(Worcester = 9.65¢)								
MANUFACTURERS' WIRE[9]															
Bright	3.55¢	3.55¢		3.55¢	3.55¢		(Worcester = 3.65¢, Duluth = 3.60¢)					4.56¢[13]		3.99¢	3.97¢
Galvanized					Add proper size extra and galvanizing extra to Bright Wire Base										
Spring (high carbon)	4.60¢	4.60¢		4.60¢	(Worcester = 4.70¢, Duluth = 4.85¢) (Trenton = 4.85¢)							5.28¢[13]		5.04¢	4.96¢
PILING, Steel sheet	3.30¢	3.30¢				3.30¢								3.71¢	3.72¢

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

Basing Point	Chromium Nickel		Straight Chromium			
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Ingot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila	Subject to negotiation			Subject to negotiation		
Blooms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt	Subject to negotiation			Subject to negotiation		
Slabs, P'gh, Chi, Canton, Balt, Phila, Reading	Subject to negotiation			Subject to negotiation		
Billets, P'gh, Chi, Canton, Watervliet, Syracuse, Balt	Subject to negotiation			Subject to negotiation		
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Water, Syracuse, Ft. Wayne, Titusville	23.00	22.50	17.50	17.50	21.00	25.50
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville	27.50	26.00	20.50	21.00	24.50	30.00
Bars, c-f, P'gh, Chi, Cleve, Canton, Dunkirk, Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet	27.50	26.00	20.50	21.00	24.50	30.00
Plates, P'gh, Middletown, Canton	31.50	29.50	23.50	24.00	28.00	33.00
Shapes, structural, P'gh, Chi	27.50	26.00	20.50	21.00	24.50	30.00
Sheets, P'gh, Chi, Middletown, Canton, Balt	39.00	37.00	29.00	31.50	35.50	39.50
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown	25.50	23.50	18.50	19.00	26.00	38.00
Strip, c-r, P'gh, Cleve, Newark, N. J., Reading, Canton Youngstown	32.50	30.50	24.00	24.50	35.00	56.50
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila, Ft. Wayne	27.50	26.00	20.50	21.00	24.50	30.00
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton	32.46	30.30	23.80	24.34	34.62	56.26
Rod, h-r, Syracuse	27.05	25.97	20.02	20.56	24.34	29.75
Tubing, seamless, P'gh, Chi, Canton (4 to 6 in.)	72.09	72.09	.....	68.49	.....	.....

TOOL STEEL

*(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. *Also Canton, Ohio)*

W	*Cr*	*V*	*Mo*	*Co*	*Base Per lb*
18	4	1	—	—	82¢
18	4	1	—	5	$1.29
18	4	2	—	—	93¢
1.5	4	1.5	8	—	59¢
6	4	2	6	—	63¢

High-carbon-chromium*	47¢
Oil hardening manganese*	26¢
Special carbon*	24¢
Extra carbon*	20¢
Regular carbon*	17¢

Warehouse prices on and east of Mississippi are 2¢ per lb. higher; west of Mississippi, 4¢ higher.

ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	Per lb
Field grade	4.50¢
Armature	4.80¢
Electrical	5.30¢
Motor	6.05¢
Dynamo	6.75¢
Transformer 72	7.25¢
Transformer 65	7.95¢
Transformer 58	8.65¢
Transformer 52	9.45¢

F.o.b. Chicago and Gary, field grade through motor; f.o.b. Granite City, add 10¢ per 100 lb on field grade to and including dynamo.

RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, heavier than 60 lb No. 1 O.H., per 100 lb	$2.75
Angle splice bars, 100 lb	3.25
(F.o.b. basing points)	*per 100 lb*
Light rails (from billets)	$3.10
Light rails (from rail steel), f.o.b. Williamsport, Pa.	3.45
	Base per lb
Cut spikes	4.85¢
Screw spikes	6.90¢
Tie plate, steel	3.05¢
Tie plates, Pittsburg, Calif.	3.20¢
Track bolts	7.00¢
Track bolts, heat treated, to rail roads	7.25¢

Basing points, light rails, Pittsburgh, Birmingham; cut spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio; Weirton, W. Va.; St. Louis, Kansas City, Minnequa, Colo.; Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa.; Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa.; Richmond.

ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)

	20x14 in.	20x28 in.
8-lb coating I.C.	$7.05	$14.10

CLAD STEEL

Base prices, cents per pound

Stainless-clad	*Plate*	*Sheet*
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Coatesville, Pa.	*24.00	*22.00
Nickel-clad		
10 pct, f.o.b. Coatesville, Pa.	21.50	....
Inconel-clad		
10 pct, f.o.b. Coatesville	30.00	....
Monel-clad		
10 pct, f.o.b. Coatesville	29.00	....
Aluminized steel		
Hot dip, 20 gage, f.o.b. Pittsburgh	....	9.00

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* Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

	Base per keg	*Delivered San Francisco*
Standard & coated nails	$4.25†	$5.33
Galvanized nails‡‡	4.00†	5.08
Cut nails, carloads, Pittsburgh base	5.80*	....

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† 10¢ additional at Cleveland, 35¢ at Worcester. ‡‡ Plus $2.75 per 100 lb galvanizing extra. *Less 20¢ to jobbers.

	Base per 100 lb	
Annealed fence wire	$4.20‡	$5.21
Annealed galv. fence wire	4.65‡	5.66

‡10¢ additional at Worcester.

To the dealer f.o.b. Pittsburgh, Chicago, Birmingham

	Base	*column*
Woven wire fence*	91	114
Fence posts, carloads	90††	...
Single loop bale ties	91	115
Galvanized barbed wire**	101	121
Twisted barbless wire	101	...

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* 15½ gage and heavier. ** On 80-rod spools in carload quantities. ††Pittsburgh, Duluth.

HIGH STRENGTH, LOW ALLOY STEELS

base prices, cents per pound

Steel	Aldecor	Corten	Double Strength No. 1	Dynalloy	HI Steel	Mayari R	Otiscoloy	Yoloy	NAX High Tensile
Producer	Republic	Carnegie-Illinois, Republic	Republic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	Great Lakes Steel
Plates	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55
Sheets									
Hot-rolled	4 30	4.30	4 30	4.30	4.30	4.30	4.30	4.30	4.30
Cold-rolled	5.30	5 30	5.30	....	5.30	5 30	5.30	5.30	5.30
Galvanized	....	5.85	....	....	....	6.00	....	....	....
Strip									
Hot-rolled	4.30	4.30	4 30	....	4.30	4.30	4.30	4.30	4.30
Cold-rolled	....	....	5.30	....	....	5.30	5.30	5.30	5.30†
Shapes	....	4.30	....	....	4.30	4.30	4.30	4.30	....
Beams	....	4.30	....	....	....	4.30	....	....	....
Bars									
Hot-rolled	4.45	4.45	4.45	....	....	4.45	4.45	4.45	4.45
Cold-rolled	....	....	....	....	....	....	....	....	....
Bar shapes	....	4.45	....	....	4.45	4.45	4.45	4.45	....

† Pittsburgh, add 0.10¢ at Chicago and Gary.

PIPE AND TUBING

Base discounts. f.o.b. Pittsburgh and Lorain, steel buttweld and seamless. Others f.o.b. Pittsburgh only
Base price, $200.00 per net ton

Standard, threaded & coupled

Steel, buttweld	Black	Galv,
½-in.	50½	34½
¾-in.	53½	38½
1-in.	56	41½
1¼-in.	56½	42
1½-in.	57	42½
2 in.	57½	43
2½ and 3-in,	58	43½
Wrought Iron, buttweld		
½-in.	+ 7	+29
¾-in.	2½	+19
1 and 1¼-in.	8	+11
1½-in.	13½	+ 7½
2-in.	14	+ 7
Steel, lapweld		
2-in.	49	34
2½ and 3-in.	52	37
3½ to 6-in.	54	39
Steel, seamless		
2-in.	48	33
2½ and 3-in.	51	36
3½ to 6-in.	53	38
Wrought Iron, lapweld		
2-in.	5½	+14½
2½ to 3½-in.	8	+10½
4-in.	12	+ 5
4½ to 8-in.	10	+ 6½

Extra Strong, plain ends

Steel, buttweld		
½-in.	49½	35
¾-in.	53½	39
1-in.	55½	42
1¼-in.	56	42½
1½-in.	56½	43
2-in.	57	43½
2½ and 3-in.	57½	44
Wrought Iron, buttweld		
½-in.	+ 2½	+23
¾-in.	3½	+17
1 to 2-in.	13	+ 7
Steel, lapweld		
2-in.	48	34
2½ and 3-in.	52	38
3½ to 6-in.	55½	41½
Steel, seamless		
2-in.	47	33
2½ and 3-in.	51	37
3½ to 6-in.	54½	40½
Wrought Iron, lapweld		
2-in.	8½	+11
2½ to 4-in.	17½	+ ½
4½ to 6-in.	13	+ 5

Basing discounts for standard pipe are for threads and couplings. For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. F.o.b. Gary prices are one point lower discount on all buttweld. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft, f.o.b. Pittsburgh in carload lots, cut length 4 to 24 ft, inclusive.

		Seamless		Electric Weld	
OD in in.	Gage BWG	Hot-Rolled	Cold-Drawn	Hot-Rolled	Cold-Drawn
2	13	$16.67	$19.99	$16.17	$19.39
2½	12	22.42	26.87	21.75	26.06
3	12	24.93	29.90	24.18	29.00
3½	11	31.17	37.39	30.23	36.27
4	10	38.69	46.38	37.53	44.99

CAST IRON WATER PIPE

	Per net ton
6-in. to 24-in. del'd Chicago	$85.06
6-in. to 24-in. del'd New York	83.30
6-in. to 24-in., Birmingham	74.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles for all rail shipment; rail and water shipment less	98.50

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

Machine and Carriage Bolts

	Percent Off List
½ in. & smaller x 6 in. & shorter	45
9/16 & ⅝ in. x 6 in. & shorter	46
¾ in. & larger x 6 in. & shorter	43
All diam, longer than 6 in.	41
Lag, all diam over 6 in. long	44
Lag, all diam x 6 in. & shorter	46
Plow bolts	54

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

½ in. and smaller	43
9/16 to 1 in. inclusive	42
1⅛ to 1½ in. inclusive	40
1⅝ in. and larger	35

On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts	USS	SAE
7/16 in. and smaller		46
½ in. and smaller	44	..
½ in. through 1 in.		44
9/16 in. through 1 in.	43	..
1⅛ in. through 1½ in.	41	42
1⅝ in and larger	35	..

In full case lots, 15 pct additional discount. For 200 lb or more, freight allowed up to 50¢ per 100 lb, based on Cleveland, Chicago, Pittsburgh.

Stove Bolts

Packages, nuts separate	65 and 10
In bulk	75

On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.

Large Rivets *(½ in. and larger)*

	Base per 100 lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	$5.65
F.o.b. Lebanon, Pa.	5.80

Small Rivets *(7/16 in. and smaller)*

	Percent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	55

Cap and Set Screws

(In packages)	*Percent Off List*
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright	53
¾ to 1 in. x 6 in., SAE 1035, heat treated	44
Set screws, cup and oval points	57
Milled studs	43
Flat head cap screws, listed sizes	16
Fillister head cap, listed sizes	37

Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.

FLUORSPAR

Metallurgical grade, f.o.b. producing plant.

Effective CaF_2 Content:	*Base price per short ton*
70% or more	$33.00
65% but less than 70%	32.00
60% but less than 65%	31.00
Less than 60%	30.00

LAKE SUPERIOR ORES

(51.50% *Fe, Natural Content, Delivered Lower Lake Ports)*

	Per Gross Ton
Old range, bessemer	$5.95
Old range, nonbessemer	5.80
Mesabi, bessemer	5.70
Mesabi, nonbessemer	5.55
High phosphorus	5.55

Prices quoted retroactive to Jan. 1, 1947.

METAL POWDERS

Prices in cents per pound in ton lots, f.o.b. shipping point.

Brass, minus 100 mesh	24¢ to 28½¢
Copper, electrolytic, 100 and 325 mesh	30¢ to 31½¢
Copper, reduced, 150 and 200 mesh	29¢ to 30½¢
Iron, commercial, 100, 200, 325, mesh 96 + % Fe carlots	10¢ to 17¢
Swedish sponge iron, 100 mesh, c.i.f. N. Y., carlots, ocean bags	7.4¢ to 8.5¢
Iron, crushed, 200 mesh and finer, 90 + % Fe carload lots	5¢
Iron, hydrogen reduced, 300 mesh and finer, 98 + % Fe, drum lots	63¢ to 80¢
Iron, electrolytic, unannealed, 325 mesh and coarser, 99 + % Fe	35¢ to 37¢
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe	29¢ to 32¢
Iron carbonyl, 300 mesh and finer, 98-99.8 + % Fe	90¢ to $1.75
Aluminum, 100, 200 mesh, carlots	23¢ to 26¢
Antimony, 100 mesh	36.05¢
Cadmium, 100 mesh	$2.00
Chromium, 100 mesh and finer	$1.025
Lead, 100, 200, & 300 mesh	18.50¢ to 23.50¢
Manganese, minus 325 mesh and coarser	49¢
Nickel, 100 mesh	51½¢
Silicon, 100 mesh	26¢
Solder powder, 100 mesh	8½¢ plus metal
Stainless steel, 302, minus 100 mesh	75¢
Tin, 100 mesh	90¢
Tungsten metal powder, 98%-99%, any quantity, per lb.	$3.05
Molybdenum powder, 99%, in 100-lb kegs, f.o.b. York, Pa., per lb.	$2.65
Under 100 lb	$2.90

COKE

	Net Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	$12.00 to $13.00
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	13.50 to 14.50
Foundry, Byproduct	
Chicago, del'd	$17.10
Chicago, f.o.b.	16.10
New England, del'd	19.50
Seaboard, Kearney, N. J., f.o.b.	17.85
Philadelphia, f.o.b.	16.75
Swedeland, Pa., f.o.b.	16.75
Buffalo, del'd	18.25
Ashland, Ohio, f.o.b.	15.50
Painesville, Ohio, f.o.b.	16.60
Erie, del'd	16.75
Cleveland, del'd	17.90
Cincinnati, del'd	15.39
St. Louis, del'd	18.03
Birmingham, del'd	15.00

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick

	Carloads, Per 1000
No. 1, Ohio	$64.00
First quality, Pa., Md., Ky., Mo., Ohio	70.00
First quality, New Jersey	75.00
Sec. quality, Pa., Md., Ky., Mo, Ohio	64.00
Sec. quality, New Jersey	59.00
No. 2, Ohio	56.00
Ground fire clay, net ton, bulk	10.00

Silica Brick

Pennsylvania and Birmingham	$70.00
Chicago District and Alabama	79.00
Silica cement, net ton (Eastern)	12.00
East Chicago	13.00

Chrome Brick

	Per Net Ton
Standard chemically bonded, Balt., Plymouth Meeting, Chester	$59.00

Magnesite Brick

Standard, Balt. and Chester	$81.00
Chemically bonded, Baltimore	70.00

Grain Magnesite

Domestic, f.o.b. Balt. and Chester in bulk	$44.50
Domestic, f.o.b. Chewelah, Wash., in bulk	24.00
in sacks	28.00

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk. Midwest; add 10¢; Missouri Valley; add 20¢	$11.05

WAREHOUSE PRICES

Base prices, delivered metropolitan areas, per 100 lb.

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Philadelphia	$4.44	$5.18	$5.69	$4.73	$5.28	$4.79	$4.52	$4.78	$5.48	$8.32	$8.42	$9.83	$9.93
New York	4.67	5.67[1]	6.07	4.97	5.80	5.02	4.72	4.97	5.52	8.37	8.47	9.87	9.97
Boston	4.70	5.57[12]	5.50[12]	4.70	6.71	5.05	4.77	4.92	5.57	8.57	8.67	9.92	10.02
Baltimore	4.29	....	5.54	4.70	....	4.74	4.84	4.75	5.45	....	....	....	....
Norfolk	4.75	....	....	5.15	....	5.00	5.00	5.05	5.85	....	....	....	....
Chicago	4.25	5.10	5.65	4.35	5.45	4.60	4.40	4.40	5.10	8.05	8.15	9.30	9.40
Milwaukee	4.399	5.249[1]	5.799	4.499	5.599	4.749	4.549	4.549	5.249	8.349	8.449	9.599	9.699
Cleveland	3.95	4.55	5.238	4.188	5.00	4.25†	4.311	4.10	4.95	8.308	8.408	9.30	9.40
Buffalo	4.25	5.10	5.95	4.65	5.61[5]	4.90	4.40	4.40	5.10	8.05	8.15	9.30	9.40
Detroit	4.35	5.20	5.97	4.64	5.59	4.84†	4.72	4.50	5.22	8.46	8.56	9.69	9.79
Cincinnati	4.471	5.166	5.166	4.694	....	4.903	4.744	4.703	5.403	....	....	....	....
St. Louis	4.549	5.399[1]	5.974	4.649	5.774	4.899	4.699	4.699	5.424	8.524	8.624	9.774	9.874
Pittsburgh	4.25	5.10[1]	5.65	4.35	4.95	4.60	4.40	4.40	4.95	8.05	8.15	9.30	9.40
St. Paul	4.584[7]	5.434[1]	5.834[2]	4.684[7]	....	4.884[7]	4.734[7]	4.734[7]	4.826[6]	....	....	....	....
Omaha	4.868	6.118[1]	6.468	5.168	....	5.418	5.218	5.218	5.918	....	....	....	....
Indianapolis	4.51	5.29	5.84	4.61	5.46	4.86	4.66	4.65	5.36	....	....	....	....
Birmingham	4.45[11]	....	5.65	4.45[11]	....	4.65[11]	4.40[11]	4.40[11]	5.93	....	....	....	....
Memphis	4.77[11]	5.79[11]	6.32	4.97[11]	....	5.12[11]	4.92[11]	4.92[11]	5.79	....	....	....	....
New Orleans	*4.98[11]	6.29[1]	....	5.18[11]	....	5.33[11]	*5.03[11]	*5.13[11]	6.29[6]	....	....	....	....
Houston	5.30	....	6.60	5.25	....	5.35	5.15	5.30	6.60	8.75[16]	8.55[16]	9.70[16]	9.80[16]
Los Angeles	5.65	7.35[1]	7.30	5.95	8.70[5]	5.40	5.25	5.40	7.25[14]	9.90[15]	9.60[15]	11.35[15]	11.35[1]
San Francisco	5.20[8]	6.65	6.85	5.50[8]	....	5.30	5.20	5.05	7.35[10]	....	....	....	....
Seattle	5.30[4]	7.10[3]	6.70	5.60[4]	....	5.45[4]	5.25[4]	5.45[4]	7.45[14]	....	9.75[6]	....	11.10[6]
Portland	5.30[4]	....	6.70	5.60[4]	....	5.45[4]	5.25[4]	5.55[4]	7.45[14]	....	....	....	....
Salt Lake City	6.25	....	7.50	6.75	....	6.10	6.25	6.35	7.40	....	....	....	....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb; strip, extras on all quantities; bars 1000 lb and over.

ALLOY BARS: 1000 to 1999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 450 to 1499 lb; (10) 500 to 999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over.

* Add 46¢ for sizes not rolled in Birmingham.

† Up to ¾ in. thick and 90 in. wide.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight.

BASING POINT PRICES

Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	37.00	37.50	38.00	38.50	.....
Birdsboro	40.00	40.50	41.00	41.50	45.00
Birmingham	32.88– 35.88	33.38– 36.38	.....	.....	.....
Buffalo	36.00– 37.50*	36.00– 38.00*	36.50– 38.50*	.....	.....
Chicago	35.50	36.00	36.50	37.00	.....
Cleveland	35.50– 38.25*	36.00– 38.75*	36.50– 39.25*	.....	.....
Duluth	36.00	36.50	37.00	37.50	.....
Erie	35.50	36.00	36.50	37.00	.....
Everett	.....	45.00	45.50	.....	.....
Granite City	36.50	37.00	37.00	.....	.....
Neville Island	36.00	36.50	36.50	37.00	.....
Provo	37.00	37.50	.....	.....	.....
Sharpsville	36.00	36.50	36.50	37.00	.....
Steelton	37.00	.....	.....	.....	42.00
Struthers, Ohio	36.50	.....	.....	.....	.....
Swedeland	41.00	41.50	42.00	42.50	.....
Toledo	35.50	36.00	36.50	37.00	.....
Troy, N. Y.	37.00	37.50	38.00	38.50	42.00
Youngstown	36.00	36.50	36.50	37.00	.....

DELIVERED PRICES (BASE GRADES)

Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$0.50 Arb.	.....	45.50	46.00	.....	.....
Boston	Steelton	5.30	.....	.....	.....	.....	47.30
Brooklyn	Bethlehem	3.30	40.30	40.80	41.30	41.80	.....
Brooklyn	Birdsboro	3.85	43.85	44.35	44 85	45.35	48.85
Cincinnati	Birmingham	5.36	38.24– 41.25	38.74– 41.74	.....	.....	.....
Jersey City	Bethlehem	2.02	39.02	39.52	40.02	40.52	.....
Jersey City	Birdsboro	2.56	.....	.....	.....	.....	47.56
Los Angeles	Provo	6.53	43.53	44.03	.....	.....	.....
Mansfield	Cleveland-Toledo	2.56	38.06– 40.81*	38.56– 41.31*	39.06– 41.81*	39.56	.....
Philadelphia	Bethlehem	1.84	38.84	39.34	39.84	40.34	.....
Philadelphia	Swedeland	1.11	42.11	42.61	43.11	43.61	.....
Philadelphia	Birdsboro	1.64	41.64	42.14	42.64	43.16	46.64
Philadelphia	Steelton	2.38	39.38	.....	.....	.....	44.38
San Francisco	Provo	6.53	43.53	44.03	.....	.....	.....
Seattle	Provo	6.53	43.53	44.03	.....	.....	.....
St. Louis	Granite City	0.75 Arb.	37.25	37.75	37.75	.....	.....

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* Republic Steel Corp. price. Basis: Average price of No. 1 hvy. mlt. steel scrap at Cleveland or Buffalo respectively as shown in last week's issue of THE IRON AGE. Price is effective until next Sunday midnight.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—$45.50; f.o.b. Buffalo — $46.75. Add $1.25 per ton for each additional 0.50 pct Si, up to 12 pct. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorous $44.00 per gross ton, f.o.b. Lyles, Tenn. Delivered to Chicago, $49.49. High phosphorous charcoal pig iron is not being produced.

FERROALLOY PRICES

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockwood, Tenn.

Carload lots (bulk)	$145
Less ton lots (packed)	172.00
Delivered Pittsburgh	151.00

$1 70 for each 1% above 82% Mn; penalty, $1.70 for each 1% below 78%.

Briquets—Cents per pound of briquet, freight allowed, 66% contained Mn.

	Eastern	Central	Western
Carload, bulk	8.00	8.25	8.80
Ton lots	9.00	9.60	11.50
Less ton lots	9.40	10.00	11.90

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Carloads	$46.00	$47.00
F.o.b Pittsburgh	50.00	51.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.

96% min. mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, bulk	32
L.c.l. lots	34

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	32
Ton lots	34
Less ton lots	36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.

	Carloads	Ton	Less
0.06% max. C. 0.06% P, 90% Mn	23.00	24.10	24.70
0.10% max. C	22.50	23.60	24.20
0.15% max. C	22.00	23.10	23.70
0.30% max. C	21.50	22.60	23.20
0.50% max. C	21.00	22.10	22.70
0.75% max. C, 7.00% max. Si	18.00	19.10	19.70

Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, 65-70% Mn, 17-20% Si, 1.5% max. C.

Carload, bulk	7.40
Ton lots	8.45
Briquet, contract basis, carlots, bulk freight allowed, per lb of briquet	7.65
Ton lots	8.65
Less ton lots	9.05

Silvery Iron (electric furnace)

Si 14.01 to 14.50%, $73.00 f.o.b. Keokuk, Iowa; $73.75 f.o.b. Niagara Falls; $70.75, f.o.b. Jackson, Ohio. Electric furnace silvery iron is not being produced at Jackson. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add 50¢ per ton for each 0.50 pct Mn over 1 pct.

Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots packed.

	Eastern	Central	Western
96% Si, 2% Fe	18.50	19.85	21.60
97% Si, 1% Fe	18.00	20.25	22.00

Ferrosilicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si. 1 lb Si briquets.

	Eastern	Central	Western
Carload, bulk	4.80	5.05	5.25
Ton lots	5.80	6.40	6.70
Less ton lots	6.20	6.80	7.10

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
25% Si	15.00	15.65	15.90
50% Si	8.80	9.30	9.50
75% Si	11.20	11.50	12.25
80-90% Si	12.70	13.00	13.75
90-95% Si	14.35	14.65	15.35

Ferrochrome (65-72% Cr, 2% max. Si)

Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
0.06% C	25.00	25.40	26.00
0.10% C	24.50	24.90	25.50
0.15% C	24.00	24.40	25.00
0.20% C	23.75	24.15	24.25
0.50% C	23.50	23.90	24.00
1.00% C	23.00	23.40	23.50
2.00% C	22.50	22.90	23.00
65-69% Cr, 4.9% C	17.60	18.00	18.15
62-66% Cr. 4-6% C. 6-9% Si.	18.60	19.00	19.15

Briquets — Contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.

	Eastern	Central	Western
Carload, bulk	11.10	11.35	11.45
Ton lots	12.00	12.90	13.50
Less ton lots	12.40	13.30	13.90

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chrominum contained, lump sie, f.o.b. shipping point, freight allowed.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

	Eastern	Central	Western
Carload	18.70	19.10	19.25
Ton lots	19.90	21.20	22.00
Less ton lots	20.60	21.90	22.70

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

	Eastern	Central	Western
Carload	23.00	23.40	23.50
Ton lots	24.35	25.00	26.20
Less ton lots	25.35	26.00	27.20

Chromium Metal

Contract prices, cents per lb, chromium contained, carload, f.o.b. shipping point, freight allowed, 97% min. Cr, 1% max. Fe.

	Eastern	Central	Western
0.20% max. C	91.00	92.50	93.75
0.50% max. C	87.00	88.50	89.75
9.00% min. C	87.50	89.00	91.25

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.

30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60-65% Si, 6.00% max. Fe.

	Eastern	Central	Western
Carloads	15.50	16.00	18.05
Ton lots	17.60	18.35	20.50
Less ton lots	18.60	19.35	21.50

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.

16-20% Ca, 14-18% Mn, 53-59% Si.

	Eastern	Central	Western
Carloads	16.75	17.25	19.30
Ton lots	18.85	19.70	21.45
Less ton lots	19.85	20.70	22.45

Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1.5¢ for central zone; 3.5¢ for western zone.

	Cast	Turnings	Distilled
Ton lots	$1.85	$2.70	$3.40
Less ton lots	2.20	3.05	4.20

CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr. 3.00-4.5% C.

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

	Eastern	Central	Western
Ton lots	17.25	18.35	20.30
Less ton lots	18.00	19.10	21.05

SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed. 60-65% Si. 5-7% Mn. 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

	Eastern	Central	Western
Ton lots	15.05	16.15	18.10
Less ton lots	15.80	16.90	18.85

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, f.o.b. plant Niagara Falls, Washington, Pa. York, Pa., per pound contained W, 5 ton lots, freight allowed	$2.50
Ferrovanadium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.	
Openhearth	$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Vanadium pentoxide, 88-92% V_2O_5 technical grade, contract basis, per pound contained V_2 A_5	$1.20
Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb	
Ton lots	$2.50
Less ton lots	$2.55
Ferromolybdenum, 55-75%, f.o.b Langeloth, Washington, Pa., per pound contained Mo.	95¢
Calcium molybdate, 40-45%, f.o.b Langeloth, Washington, Pa., Per pound contained Mo.	80¢
Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo	80¢
Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo	80¢
Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y. ton lots, per pound contained Ti	$1.23
Less ton lots	$1.25
Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti	$1.35
Less ton lots	$1.40
High carbon ferotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton	$142.50
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. (Siglo) Tenn., $3 unitage per gross ton	$65.00
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Carload lots	18.40¢
Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy	
Carload, bulk	6.00¢
Alsifer, 20% Al, 40% Si, 40% Ft, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	6.50¢
Ton lots	7.00¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Car lots	9.00¢
Ton lots	9.75¢

Boron Agents

Contract prices per pound of alloy, f.o.b. shipping point, freight allowed.

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.

	Eastern	Central	Western
Less ton lots	$1.30	$1.3075	$1.329

Manganese — Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max C.

Ton lots	$1.89	$1.903	$1.935
Less ton lots	2.01	2.023	2.044

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.

Less ton lots	$1.80	$1.8125	$1.8445

Silcaz, contract basis, f.o.b. plant freight allowed, per pound.	
Carload lots	37.00¢
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.	
No. 1	87.5¢
No. 6	60¢
No. 79	45¢
Bortram, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, f.o.b., Suspension Bridge, N. Y., freight allowed, Ti 15—17%, B 0.90—1.15%, Si 2.5—3.0% Al 1.0—2.0%.	
Ton lots, per pound	8.0¢

Depreciating Assets Replacement Becoming Most Serious Problem

New York

• • • **"Among the special** problems that confront business concerns at present as a result of the general rise in prices, one of the most important is that of making adequate provision for the replacement of depreciating capital assets," states the Guaranty Trust Co. of New York in the current issue of *The Guarantee Survey*, its monthly review of business conditions, which has just been published.

"The rise in replacement costs has created a situation which needs to be recognized and dealt with by the large majority of industrial concerns. The impact of the problem varies widely in individual cases, and the most appropriate means of dealing with it probably differ accordingly. Some companies expanded their facilities rapidly during the war and face no immediate replacement problem, while others were prevented from fully maintaining their equipment and are now obliged to make replacements on an abnormally large scale.

Some enterprises and some industries are growing more rapidly than others and must make provision for large additions as well as replacements. Swift technological changes in some industries make obsolescence a much more important factor than in others. Depreciation itself represents a widely varying proportion of total cost of production in different industries. In some cases it has been possible to make replacements and additions with war-surplus equipment purchased at very moderate prices.

"The current practices of business concerns in dealing with the problem (or in not dealing with it) vary widely. Some companies have increased their depreciation charges in recognition of higher replacement costs. Outstanding among these is the U. S. Steel Corp., which charged off an additional $12½ million during the first half of this year on the ground that the present-day cost of new facilities to replace worn-out or obsolete equipment is substantially higher than the original costs on which normal depreciation rates are based.

Other concerns, instead of increasing their depreciation charges,

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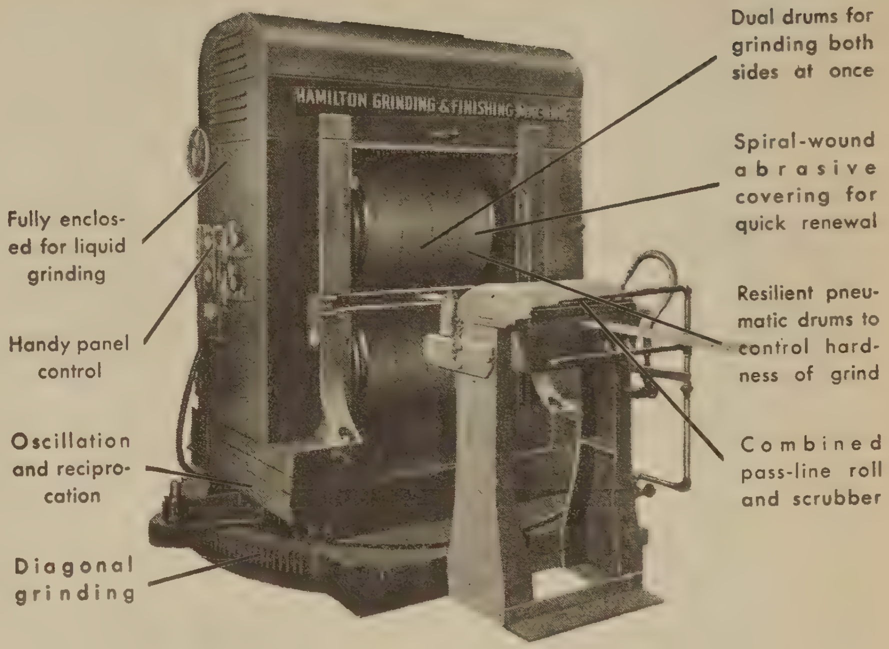
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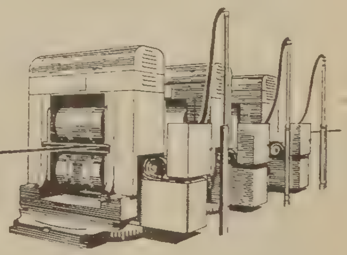

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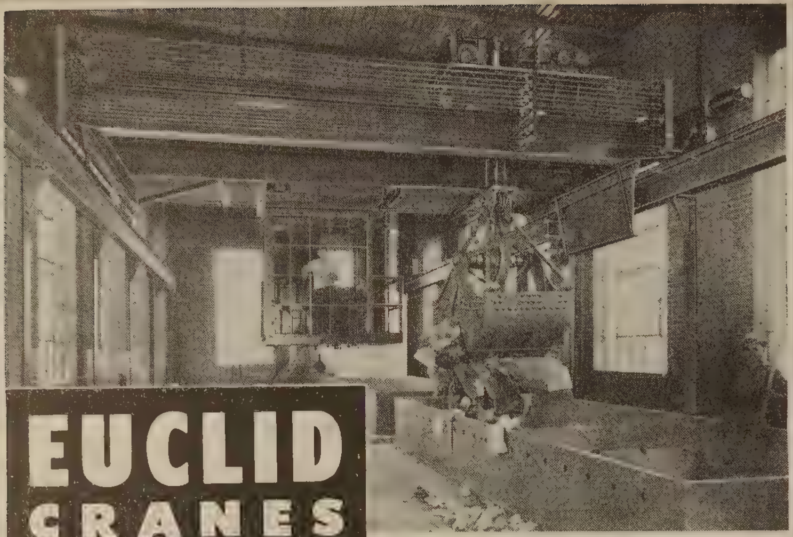

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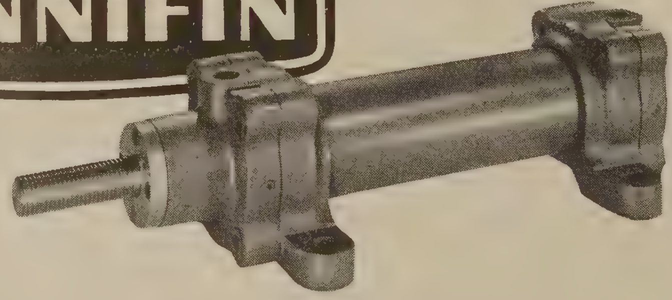

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have set up special reserves for the replacement of facilities. Still others rely on the general contingency reserves established during or since the war, believing these adequate to cover the rise in replacement costs. In some cases no special reserves have been set up, but financial and dividend policies have been revised to provide funds for the purchase of new equipment at the higher prices.

"No general conclusion as to prevailing business policy in this respect is possible on the basis of available data. Some broad tendencies, however, are indicated by a recent survey of business executives by the National Industrial Conference Board. The majority of executives responding to the inquiry agree in regarding underdepreciation as a serious problem, and some take the view that costs are understated and profits overstated unless allowance is made for the rise in replacement costs.

"While only a minority of companies have actually altered their accounting methods, frequent changes have been made in financial practices and in transfers to surplus. Many companies, on the other hand, indicate no immediate concern at the high cost of replacements, either because of the offsetting influence of higher profits or on account of special factors tending to minimize the importance of current replacement costs in individual cases.

"Some companies are more concerned at the prospect of high depreciation costs on equipment acquired at present prices than at inadequate depreciation charges on older equipment. In the oil industry, for example, capital expenditures in the next two years are expected to be equal to almost one-fourth of the present total investment in facilities; and it is pointed out that refinery facilities now cost from two and one-half to three times as much per barrel of capacity as before the war.

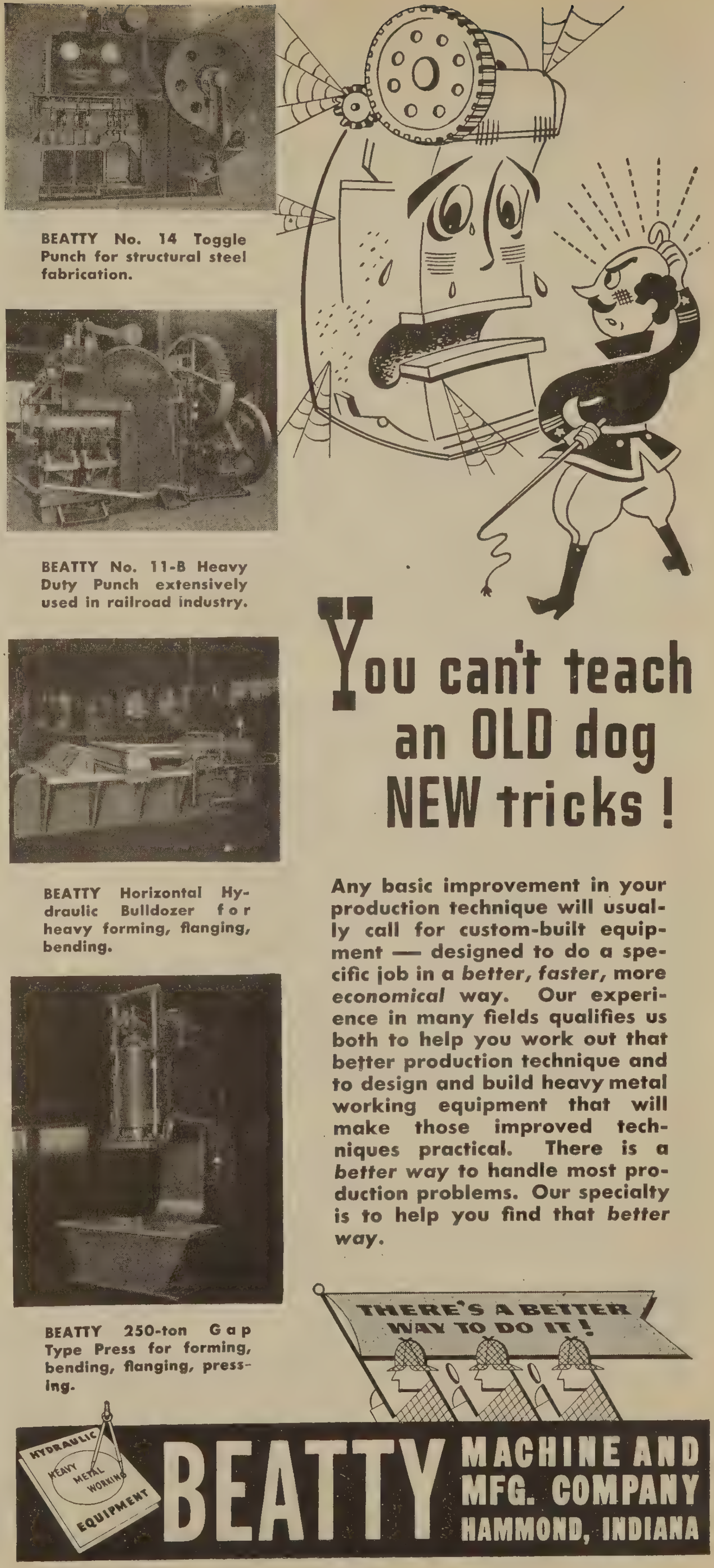
"The same apprehension is evident in other industries. Believing that current construction costs are excessive, E. I. du Pont de Nemours and Co. has adopted the policy of anticipating accelerated depreciation in the early years of operation of newly constructed plants by setting aside out of income a reserve for excessive construction costs in the year incurred. The amount set aside for this purpose in the first half of 1947 was $10½ million.

"The Libbey-Owens-Ford Glass Co. recognizes both aspects of the problem, pointing out that if the present high level of construction costs should continue into the future, normal depreciation allowances for replacement of existing prewar plants would be inadequate, while if future costs should prove to be substantially lower, present costs would be out of line with normal values. On the assumption that one or the other of these possibilities must be faced in the future, a charge of $1 million has been made against earnings for the second quarter of this year, with an offsetting credit to a reserve for revaluation.

"From the accounting standpoint, it is questionable whether the charging of depreciation on the basis of original cost can be properly termed underdepreciation. To charge depreciation at the old rate, distribute the profits as thus calculated and finance the increase in replacement cost by the issue of new securities would appear to be a logical and theoretically sound accounting procedure. As a practical matter, however, there are probably few concerns that would not find it preferable to meet the additional replacement cost to the greatest possible extent by reinvesting a share of earnings.

"If, on the other hand, the rate of depreciation is increased in recognition of the higher replacement cost, consistency would seem to require that the value of the asset be written up accordingly and the appreciation carried to surplus. The serious practical objections to such revaluations of assets are well known. A possible alternative would be to handle the additional depreciation as a special surcharge to be credited to surplus either currently or when the asset was retired.

"These questions of accounting procedure are of more theoretical than practical importance. From the point of view of management, the problem is primarily one of finance. Whether the books are kept on the basis of originally invested dollars or of current dollars, management must retain a share of earnings sufficient to meet replacement costs as and when incurred,



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unless it is prepared to resort to the money market for the necessary funds.

"As far as the tax aspects of the question are concerned, greater liberality and flexibility in the administration of the revenue laws would certainly be helpful, both in encouraging the adoption of sound methods of dealing with the rise in replacement costs and in stimulating capital expansion. One simple and desirable change would be to restore the rule abandoned in 1934, whereby depreciation deductions taken by taxpayers 'will not be disallowed unless shown by clear and convincing evidence to be unreasonable.' Another would be to allow, within appropriate limits, tax-free credits to replacement reserves—not based on questionable definitions of costs and profits but rather on the practical desirability of encouraging sound and foresighted financial methods.

Section 102 should certainly be administered in such a way as not to inhibit the adoption of such methods. The purpose of this section is to prevent tax avoidance, not to regulate financial policy. Experience has shown that the general inclusion of the 70 pct question on 1946 returns has in some cases deterred corporations from following what they believed to be sound financial practices for fear of incurring severe tax penalties. The use of any such arbitrary standard should be discontinued. It is reported that the 70 pct question will be omitted from 1947 tax returns.

"The problem of high replacement costs deserves wider attention, both from business management and tax authorities, than it appears to have received. Whether provision for meeting the costs is labeled depreciation or is called by some other name, sufficient funds to meet present and estimated future replacements at existing prices should be systematically withheld from distribution to owners and retained for such reinvestment, except in the probably few instances where the incurring of new capital obligations is deemed preferable as a matter of financial policy. And a major objective of tax administration should be to encourage rather than restrain the setting aside of adequate funds for that purpose."

British Motorists Are Now on Wartime Gas Rationing Basis

London

• • • The Government's decision to withdraw the basic gasoline ration is a severe blow to British motoring. Private motorists will have to lay up their cars—or sell them. They are back to wartime procedure. Car owners who must use their vehicles for business purposes will receive a limited amount of gasoline, but they will be liable at any time to be stopped by the police and questioned as to their right to be on the road.

A motorist during the war making an essential business trip from A to Z was likely to be in trouble if he was found even a few yards off the route without just cause or good excuse. "Joyriding" was verboten then, and presumably will be again.

What the effect will be on the second-hand car market is not yet known. A slump is freely forecast, but there have not been enough transactions yet to test the trend. Owners and traders alike are too dazed to do anything more than mark time for the present.

There is doubt also as to the effect on the huge backlogs of orders for new cars. Wholesale cancellations are expected by some manufacturers, little change by others. A representative of the Nuffield organization said that no extensive cancellation of orders was expected, because motorists who urgently needed cars for business or other essential uses would obviously not cancel their orders and lose their places in the queue. On the other hand, Sir Rowland Smith, Ford managing director, said that in his opinion the huge order-books held by car distributors would deflate overnight. The resulting surplus could not be absorbed by the export market because many countries were banning the importation of British cars and there was insufficient shipping to transport the existing export quota.

The Government, for their part, are expecting some help in furthering their economic plans, apart from the dollar saving accruing from the ban on private motoring.

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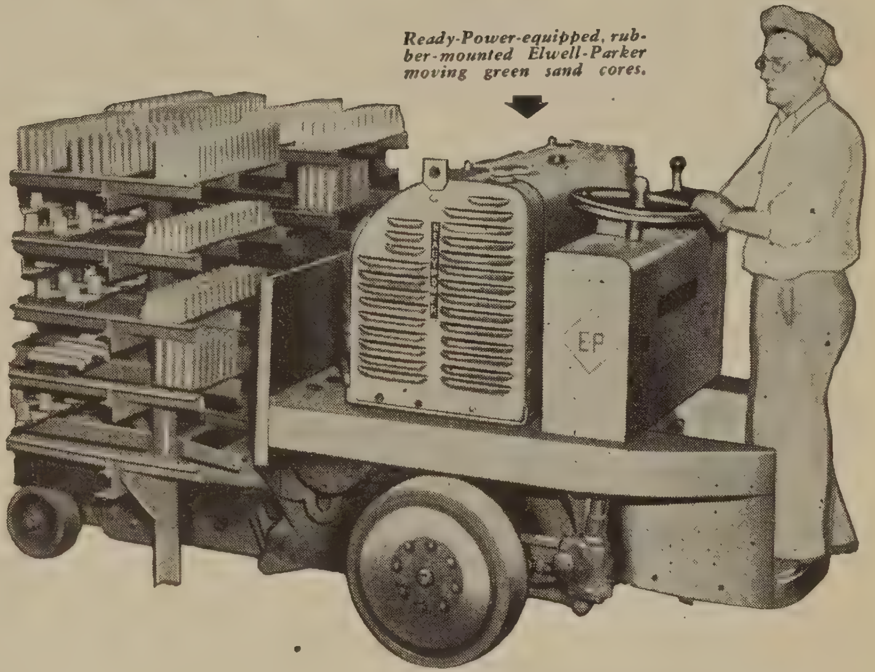

Ready-Power-equipped, rubber-mounted Elwell-Parker moving green sand cores.

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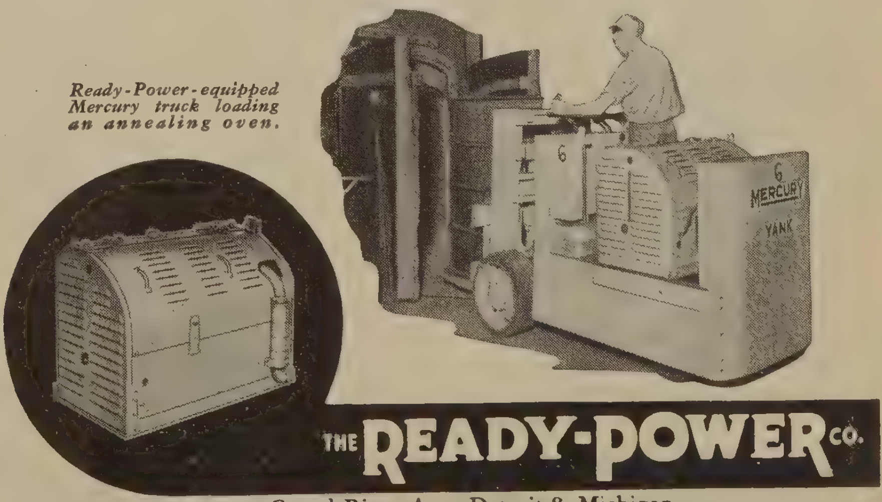

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Mr. Wilmot, Minister of Supply, told representatives of the industry that the utmost economy had to be exercised in the use of raw materials and that it was necessary to ensure that, after essential home needs had been provided for, the rest of Britain's car production was exported.

He indicated that, in consequence of the abolition of the basic petrol ration, only people needing cars for essential purposes would require new ones, and the first problem was to arrive at an estimate of the size of this essential home demand. This figure would then be fixed as the maximum production permitted for the home market, and the allocation of materials for additional production would be based solely on exports. The Minister emphasized that there would have to be a much greater degree of standardization than at present and a speeding up of the process of reducing the number of models.

In future the number of firms manufacturing passenger cars must be limited to those making the cars most readily salable abroad. Because difficult technical problems were involved and the proposals would ultimately result in serious changes in the industry, the Minister did not suggest that decisions should be made immediately, but asked the industry to give the whole problem immediate and detailed attention. This was agreed to by the representatives of the industry.

Builders Told Steel Output May Not Meet Demand for 2 Years

Washington

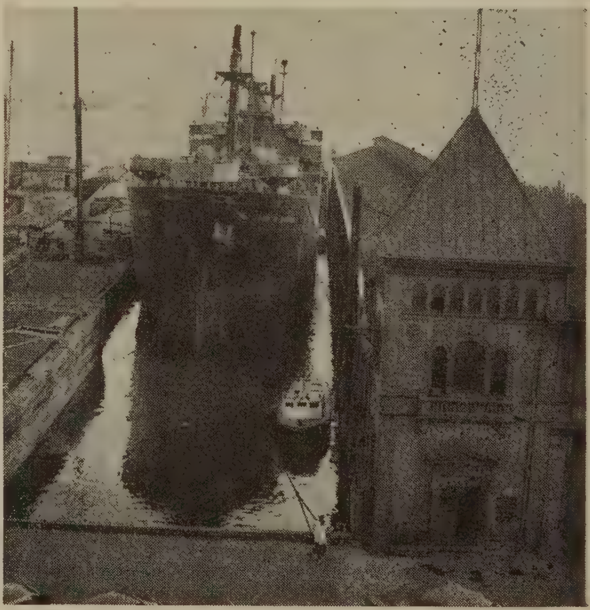
• • • **With construction** expenditures at a 5-year high and homebuilding at its greatest peak since 1925, as in other industries builders are plagued with the continued shortages of steel and fabricated metal products.

Builders considering their growing backlog of unfilled orders for structural steel and sheet metal products gather little comfort from the steel industry's estimates that production may not balance requirements for another 2 years.

Moreover, prices for building materials are scarcely calculated to lift their spirits despite the current full-scale Congressional investigation into both shortages and prices. Effect of this move by the government, if any, is not expected to be evident for some time to come.

Meanwhile, the Dept. of Commerce reports that August expenditures for construction amounted to $1.4 billion and employment within the industry reached nearly 2 milion. In view of rising costs, however, a better yardstick for measuring activity is actual construction.

For August, Commerce reports, home-building aggregated 83,000 starts and 70,000 completions. Total residential units started during the first half of 1947, exclusive of farm homes, amounted to approxi-



SHIPBOARD EDUCATION: *For the first time, the New York City Metropolitan Vocational High School has a ship to use as an auxiliary to dry land studies. Advanced students in various subjects will spend half their time aboard ship.*

mately 524,000 while the total completions (including parts carried over from 1946) added up to 500,000.

Availability of materials and costs have combined to act as a partial brake on the tempo of homebuilding. While output of building material supplies in 19 major categories continued to improve as a whole and stands at 19 pct above levels for the first half of 1946, when it comes down to cases, some of the improvements are spotty and others have shown but little or no increase. Two, mechanical stokers and range boilers, showed a drop.

Also, though prices have recently advanced at a slower rate than during the first 4 months of the year, by July they stood (as a whole) at 94 pct above 1939 levels even when measured by the Bureau of Labor Statistics index.

Sheet steel, the hair shirt of the steel industry and basic source of many buildings supplies, continues short—critically so in some items such as certain gages of galvanized sheet. The latter is needed in production of ducts, flashings, downspouts, gutters, roofing, etc., but the Commerce report holds out no hope of improvement for the remainder of 1947.

Reports indicate that more and more aluminum sheet is being substituted for sheet metal products. Likewise, use of aluminum windows is on the increase; with improving production of both steel and aluminum window production, the forecast is that supply and demand for this item will soon reach a balance.

Supplies of light metal shapes appear adequate, the Commerce estimate says, but for items such as open web steel joists production is not up to capacity due to the limited supply of steel. Inventories have run out and the backlog of orders is on the increase.

Heavy hardware shows a steady improvement; builders' hardware, while recording improved output since January, is still short of demand but is expected to balance during the last quarter of 1947. Orders for screen cloth are expected to exceed production until early 1948.

Nail production which, under the stimulus of premium payments, had risen to 77,000 tons in April dropped back to 71,000 tons in May following the termination of

Lift ferrous metals *this way*

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MAGNETIC MATERIALS HANDLING is a *proved way* to offset higher hourly wage scales.

Ohio Magnets, for example, whisk strip steel coils from one plant area to another *without handling assistance on the floor.*

There is a specific Ohio Magnet for every *hot or cold* ferrous metal handling job: billets, slabs, ingots, scrap, plate, coils, sheets, rails, wheels, etc. Round magnet sizes range from 12 to 65 inches diameter. Rectangular Ohio Magnets are available in sizes from 25 to 85 inches long.

Ohio Magnets feature heavier construction for *longer life.* This extra weight is *distributed* throughout copper coils, insulation and steel frame—for greater lifting efficiency.

Here's an important maintenance feature too. Ohio chain ears last longer because they have *square holes* for chain pins to eliminate friction.

Many Ohio Magnets sold 25 years ago are *still in use . . .* still cutting costs. They are an even better investment today. Call on Ohio: *a leader in magnetic materials handling.*

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Cuts Gas and Oxygen Cost!
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With Weldit Gasaver installed the operator simply hangs his torch on the handy lever rod of the Gasaver. The weight of the torch pulls the lever rod down, closing the valves of the Gasaver, thus shutting off both gas and oxygen intake lines. The usual idle flame and needless waste of oxygen and gas between operations is thus eliminated—no fire hazard or danger of injury to workers.

When the torch is again picked up for further welding operations, the operator passes it across the pilot light of the Gasaver, thereby instantly igniting the torch at the pre-adjusted flame, ready for work — no adjustments to make.

Gasaver can be installed any convenient place on the line between regulators and torch. Most of America's largest production plants are now Gasaver equipped.

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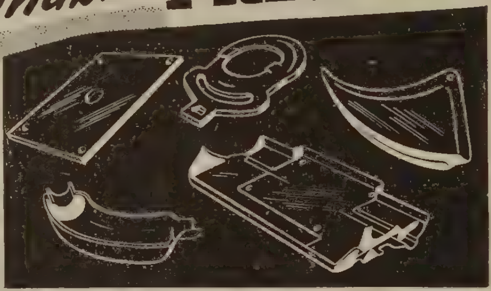

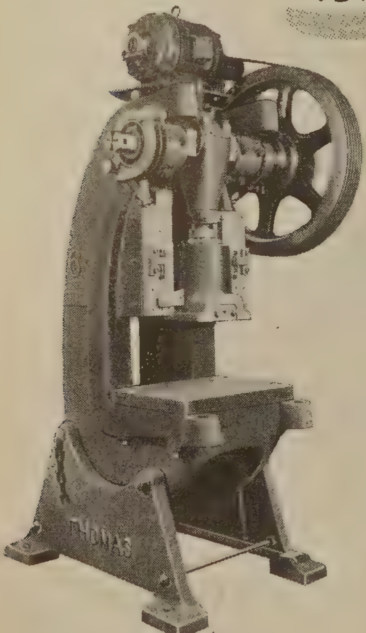

These recently introduced Thomas Inclinable Presses are now available for reasonable deliveries in 50, 75 and 100 ton sizes. They fittingly supplement the nationally famous line of Thomas equipment for Industry's varied metal-fabricating requirements. Write for information.

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the sudsidy and went still further downward to 65,000 tons in June. Supplies for the third quarter remained tight and shipments to small dealers and distributors were spotty. While the black market appeared to have vanished, Commerce said, prices were still running well above OPA levels.

Engineers Meet And Discuss Their Part In Furthering UNESCO

London

• • • The Council of the World Engineering Conference met in Zurich on Sept. 9, 10 and 11, when national delegations or representatives were present from the following 25 nations: Austria, Belgium, Brazil, Bulgaria, Denmark, Egypt, Finland, France, Great Britain, Hungary, India, Iran, Italy, Luxembourg, Norway, Palestine, Holland, Philippines, Poland, Roumania, Sweden, Switzerland, Czechoslovakia, Yugoslavia, and the United States. Dr. F. Malina represented UNESCO. The U.S. delegate was General Stewart E. Reimel, of the Engineers' Joint Council of the U.S.

The conference, which has among its main objects the association of engineers and technicians in a world organization, the training of engineers and technicians to fulfill adequately their social duties, and their representation in the various international organizations, was particularly concerned with the part to be played by engineers and technicians in the development of UNESCO.

The council, on the motion of the British delegation, resolved to set up a permanent committee for the study of effects of technological development on social and international relations. This committee will work closely with UNESCO. The council also decided on the immediate establishment of a committee to study the effects of power production in the world of today.

These two studies, and the formulation of recommendations based thereon by the engineers and technicians of the world, will be one of the chief portions of the council's work during the next 12 months.

Presented ASM Award For Research in The Use of Shot-Peening

Detroit

• • • **The Albert Sauveur** achievement award of the American Society for Metals for 1947 has been awarded to F. P. Zimmerli, chief engineer of Barnes-Gibson-Raymond Div., Associated Spring Corp., Detroit. Mr. Zimmerli will receive the award in recognition of his basic research in the use of shot-peening to increase favorable stresses on the surface of highly-stressed metal parts.

A plaque accompanying the award will state that Mr. Zimmerli first conceived the idea about 20 years ago that shot-peening could be used to advantage to increase the fatigue life of springs. In 1929 the company with which he is associated started to ship springs so treated.

The plaque goes on to point out that this is the earliest record of such production and marks the beginning of an industry-wide development. Much of the knowledge the industry now has of surface stress is dependent on extension of the original work conducted by Mr. Zimmerli, the ASM award states.

The scroll and plaque will be awarded to Mr. Zimmerli in Chicago on Oct. 23 at the annual meeting of the American Society for Metals.

Mr. Zimmerli has been associated with Barnes-Gibson-Raymond for the past 20 years.. He holds degrees of B.S.E. (1917), M.S.E. (1918) and Metallurgical Engineer (1934) from the University of Michigan. Before joining Barnes-Gibson-Raymond, Mr. Zimmerli was employed by the Solvay Process Co., Dodge Bros. and Rickenbacker Motor Co.

During World War II, Mr. Zimmerli and his associates were instrumental in developing spring wire that was widely employed as a substitute for Swedish spring material. Prior to the war many U. S. manufacturers were said to be wholly dependent on Sweden for spring wire and failure to develop a satisfactory substitute might have had a tremendously adverse effect on U. S. war pro-

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Total oil-immersion of the compensator-mechanism not only permits interrupting the circuit under oil (recognized as an effective means for breaking alternating currents) but also provides continuous lubrication for all operating parts of the mechanism and protects them from dust, moisture and corrosion.

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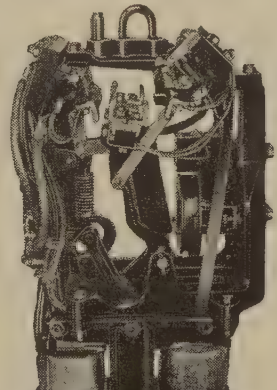

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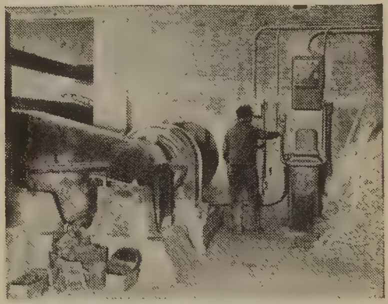
Single, quick-break, double-throw Contactor operated by a *single* magnet. Quick transfer from reduced voltage starting to full voltage running by a throw-over spring and a mechanical latch tripped by a current limit relay.



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duction, according to informed sources.

The American-developed substitute wire used for valve springs is said to have even better fatigue properties than the Swedish wire that had previously been used; the resistance to load loss due to heat is also reported to be better in the American product.

Canadian Pacific Ry. Places Rolling Stock Orders for $16 Million

Montreal

• • • **Canadian Pacific Railway** Co. has placed rolling stock orders to the value of upwards of $16 million, involving 1295 freight and express cars and 52 locomotives, William Manson, vice-president, announced. The contracts were awarded from a $22,500,000 appropriation made last month, and orders for 11 locomotives and 500 gondola cars will be placed soon to take up the remaining $5,900,000.

The Canadian Pacific Railway's full appropriation for rolling stock this year will total $47 million, and calls for 4970 freight cars and 76 locomotives, as orders to the value of $24 million were placed last March.

Of the orders placed, Canadian Locomotive Co., Kingston, Ont., received contract for 30 locomotives to cost $3,800,000, and the Montreal Locomotive Works, Montreal, has orders on hand for 22 and 11 more will be received soon. The latter order covers two special types of locomotives which have been designed by the C.P.R. staff.

Among other orders placed are to National Steel Car Corp., Hamilton, 750 box cars at $4 million, 175 refrigerator cars at $2 million, and 100 covered hoppers at $750,000. Canadian Car & Foundry Co., Montreal, received orders for 10 mail-express cars, 10 baggage-express cars, and other freight cars at total of $4,600,000. Eastern Car Co., Trenton, N.S., subsidiary of Dominion Steel & Coal Co., will build 250 hopper cars valued at $1,300,000.

Canadian National Railways placed large rolling stock orders earlier this year.

Food Temperature Study By Automatic Recording

Washington

• • • **The Truck-Trailer** Manufacturers Assn. has disclosed that consideration is being given in the highway freight trailer-building industry to introduction of automatic recording instruments for the perishable foods transportation branch of motor service, at least in connection with the heavier types of vehicles and the longer hauls.

Heretofore, most of the temperature recording on mobile highway units has been for the purpose of studying and testing operating performance of various insulations and refrigeration systems. Now the vital need for accurate temperature records has been recognized by producers, haulers and consignees of perishable foodstuffs.

An initial automatic instrument was mounted on a refrigerated trailer in regular service of the motor carrier. A special vibration-free mounting was devised by the trailer manufacturer.

The instrument and installation were described as follows: For the purposes of compactness, and in order to assure ruggedness, a 10-in. diam die-cast aluminum instrument case was utilized. This case is gasketed to render it dust-proof and moisture-proof. The recording chart itself is 8 in. in diameter with provision for a continuous 7-day record. The chart records temperatures from minus 40° to plus 110° F, and is rotated by a 7-day, hand-wound chart drive.

A special bucket-type noncorroding stainless steel pen is provided, with a stable pinion and gear adjustment to insure proper pen position. This pen provides a continuous ink record of temperatures as determined by expansion and contraction of a gas-filled thermal system. The thermal system consists of a remote steel bulb which is located within the trailer body and which is connected to an instrument-contained helix by means of bronze armored capillary tubing. The bronze helix has been heat-treated to insure permanent calibration, and resultant accuracy is within plus 0.7 of 1° F.

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PERM-A-CLOR and TRIAD, vapor degreasing solvents, and TRIAD alkalis and emulsions, give trouble-free performance.

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Hourly Earnings Reach New Level for July; Real Wages Decline

New York

• • • **Hourly earnings** during July rose to a new peak while other payroll statistics showed a decline over the same period, according to the monthly survey of the National Industrial Conference Board of payroll statistics for production workers in 25 manufacturing industries.

Hourly earnings rose for the twenty-first consecutive month during July to reach $1.352. Meanwhile, weekly earnings, "real" hourly earnings, actual and nominal hours, employment, total man hours and payrolls declined during July.

Reported wage increases amounted to 0.3 pct for all workers, with only three industries reporting increases averaging more than 1 pct for all workers in the industry.

Hourly earnings have risen each month since October, 1945. The June-July increase amounted to 0.4 pct.

Weekly earnings in July ($53.60) declined 1.2 pct from the peak level of June. Since August 1939, the last month before the start of the war in Europe, weekly earnings have increased 96.4 pct.

After rising for three consecutive months, "real" weekly earnings (actual earnings adjusted for changes in the consumer's price index in terms of 1923 dollars) dropped 2.1 pct from June to July 1947.

"Real" weekly earnings are 1.9 pct greater than in July 1946. They are 30.4 pct more than during August 1939 (month before the beginning of war in Europe).

Working hours declined 0.6 hr or 1.5 pct from June to July. The work week for July 1947 was 39.7 hr. This represents the fifth consecutive month of declining working hours.

Nominal hours (the scheduled number of hours at operation of a plant, shift or department) dropped 0.1 hr in July, making the average in July 3.5 hr less than the nominal week of early 1945.

Declines in employment in the 4 months since March placed the index in July 3.0 pct below that of March 1947, and 5 pct above the index for July 1946. Since November 1943, employment has declined 18.9 pct. Only seven of the twenty-five industries increased the number of employed workers from June to July.

Payrolls declined 3.1 pct from June to July 1947. They were, however, 8.7 pct below the November 1943 peak. July 1947 payrolls were 187 pct greater than in August 1933, just before the start of the war in Europe.

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Workers' Attitudes Learned by Surveys Are Production Key

New York

• • • **Learning workers' attitudes** through employee surveys is the first step in obtaining greater employee cooperation and productivity, declared James C. Worthy, of the personnel department, Sears, Roebuck & Co. recently. "Attempts by management to obtain greater employee cooperation and productivity by education in the virtues of such intangibles as the free enterprise system—without first ascertaining workers attitudes toward the company and specific job environment—are futile," he said.

In an address before closing sessions of the American Management Association's two-day personnel conference here, Mr. Worthy, speaking for his company, said:

"We are very sure that employee attitudes cannot be influenced effectively by direct frontal attack. We have not considered it worth our while to try to explain 'management's point of view' to our employees, nor to educate them on the 'economic facts of life,' nor to sell them on the virtues of the free enterprise system. Frankly, we are deeply skeptical of the utility of such an approach and strongly suspicious that it creates more antagonism and distrust than it wins converts.

"We recognize that in our efforts to retain the loyalty and support of our employees we are dealing with a problem far too complex to be handled in terms of 'winning friends and influencing people.'

"Rather than worry about teaching our employees the 'economic facts of life'," Mr. Worthy continued, "it would be better for us in management to keep in mind one of the basic 'social facts of life,' namely that attitudes are a product of experience. If the worker's experience on the job causes him to dislike or distrust management, no amount of 'education' will change his feelings or his behavior."

Mr. Worthy was preceded by Clark W. King, vice-president of Allegheny Ludlum Steel Corp., who urged greater activity by management in making its functions and thinking better known not only to employees but to the public as well.

Assailing management for "sitting around conference tables talking about how right we are," Mr. King stated:

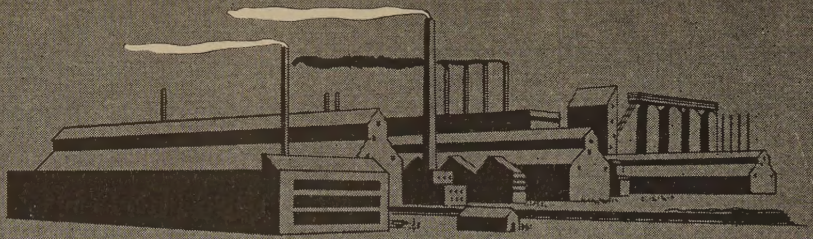
"Understanding of management's functions, policies and philosophy by employees and the public is more essential in our land today than ever before in our history."

Permits German Entry

Washington

• • • **Military permits** to enter the British and American zones of Germany for commercial purposes have been issued to Charles A. Maynard and Alfred D. Plamondon, both of Indiana Steel Products, Chicago, the Army announces. They are scheduled to arrive in Germany between Oct. 1 and Nov. 10.

Other business representatives granted visiting permits for the same period include Frank Kullmer of the Soule Steel Co., San Francisco; Henry Kent of the Kent Metal & Chemical Works, Edgewater, N. J.; Henri Wiethase of the B & B Pipe & Tool Co., Long Beach, Calif., and Henry DuBois Rolph of Yale & Towne Mfg. Co., of New York.



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Steel Employment In August Jumps to Hit Highest Level in 1947

Washington

• • • Steel **industry** employment jumped by 25,000 workers to a peak of 1,847,000 during August, reflecting an increase in nonagricultural industries to 42,558,000 employees during the month.

Bureau of Labor Statistics estimates the August peak to be due to improved materials supplies, returns from vacations, new orders and strike terminations. The month recorded the highest level of employment in 1947, but still below the postwar peak of December 1946.

Iron and steel and their products, taken together with nonelectrical machinery, accounted for a gain of about 50,000 workers in August. BLS estimates that the former group of industries employed 676,000 more workers in August 1947 than in August 1939. Nonelectrical machinery workers numbered 821,000 more in August of this year than in August 1939.

Although automobile employment continued a slight downward trend in August because of steel shortages, the rubber tire and tube industry took on more workers during the month.

Railroad equipment manufactures gained during the month, while shipyard employment remained at a low level due to work stoppages. Small rises in mining, transportation and public utilities, trade, finance, and government employment were offset by a decline in service industries. Bituminous coal mining had almost returned to June levels.

Vet Rehiring Record Set

Pittsburgh

• • • A **reemployment** record which if equaled by all firms in the Pittsburgh district would make unnecessary a campaign for the employment of some 23,000 local veterans has been established by Oliver Iron & Steel Corp., according to Joseph B. Patton, personnel manager. "Oliver," Mr. Patton said, "has actually rehired 108 pct of its quota of returned veterans—a record which would wipe out veteran unemployment if followed by all firms."

Oliver's employment records to date show that 72.8 pct of all the workers who left the company for military service have been rehired and that an additional 35.2 pct, consisting of veterans not of former Oliver employment, have been hired, bringing the total to 108 pct.

FLOATING PICKETS: *Striking members of the United Industrial Marine Shipworkers Union carry a placard as they row a boat in Boston harbor in front of the Simpson plant drydock of the Bethlehem Steel Co.*

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